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AERODYNAMIC CHARACTERISTICS OF FOREBODY AND NOSE STRAKES BASED ON F-16 WIND TUNNEL TEST EXPERIENCE

VOLUME II DATA BASE

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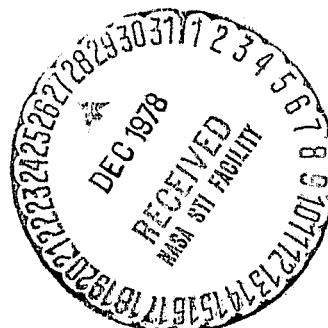


TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
	LIST OF FIGURES	iv
	INTRODUCTION	1
1.	LOW SPEED PITCH DATA	3
2.	LOW SPEED SIDESLIP DATA	135
3.	TRANSONIC PITCH DATA	277
4.	TRANSONIC SIDESLIP DATA	555

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LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-1	Effect of Slotted Strake Z22A, Configuration 401F-5, HT = 0 (a) Lift and Pitching Moment (b) Drag	9
1-2	Effect of Slotted Strake Z22A, Configuration 401F-5, HT = -10 (a) Lift and Pitching Moment (b) Drag	11
1-3	Effect of Slotted Strake Z29A, Configuration 401F-16 (a) Lift and Pitching Moment (b) Drag	13
1-4	Effect of Rotating Strakes Z33A' and Z33B', Configuration 401F-16 (a) Lift and Pitching Moment (b) Drag	15
1-5	Effect of Rotating Strakes Z33A-Z33D, Configuration 401F-16 (a) Lift and Pitching Moment (b) Drag	17
1-6	Effect of Rotating Strakes Z33E-Z33H, Configuration 401F-16 (a) Lift and Pitching Moment (b) Drag	19
1-7	Effect of Rotating Strakes Z33C and Z33I, Configuration 401F-16 (a) Lift and Pitching Moment (b) Drag	21
1-8	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16, LEF = 0 (a) Lift and Pitching Moment (b) Drag	23
1-9	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16, LEF = 25° (a) Lift and Pitching Moment (b) Drag	25

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-10	Effect of Forebody Strakes Z55 and Z56, YF-16 (a) Lift and Pitching Moment (b) Drag	27
1-11	Effect of Large Rotating Strakes Z57 and Z58, YF-16 (a) Lift and Pitching Moment (b) Drag	29
1-12	Effect of Forebody Strakes Z63-Z66, YF-16 + 30.5 Stretch (a) Lift and Pitching Moment (b) Drag	31
1-13	Effect of Forebody Strakes Z67-Z70, YF-16 + 44.5 Stretch (a) Lift and Pitching Moment (b) Drag	33
1-14	Effect of Horizontal Tail Deflection With Strakes Z63 and Z66, YF-16 + 30.5 Stretch, LEF = 0 (a) Lift and Pitching Moment (b) Drag	35
1-15	Effect of Horizontal Tail Deflection with Strakes Z63 and Z66, YF-16 + 30.5 Stretch, LEF = 25° (a) Lift and Pitching Moment (b) Drag (c) Increments, HT = 0 (d) Increments, HT = 25°	37
1-16	Effect of Leading-Edge Flap Deflection with Strakes Z63 and Z66, YF-16 + 30.5 Stretch (a) Lift and Pitching Moment (b) Drag (c) Increments	41
1-17	Effect of Fuselage Stretch, Z64 (30.5 Stretch) and Z68 (44.5 Stretch), LEF = 0 (a) Lift and Pitching Moment (b) Drag	45

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-18	Effect of Fuselage Stretch, Z64 (30.5 Stretch) and Z68 (44.5 Stretch), LEF = 25° (a) Lift and Pitching Moment (b) Drag (c) Increments	48
1-19	Effect of Leading Edge Flap Deflection with Strakes Z67 and Z70, YF -16 + 44.5 Stretch (a) Lift and Pitching Moment (b) Drag	51
1-20	Effect of Horizontal Tail Deflection with Strakes Z67 and Z70, YF-16 + 44.5 Stretch (a) Lift and Pitching Moment (b) Drag (c) Increments	53
1-21	Effect of Nose, Z76, and Canard, Z86, YF-16, HT = 0 (a) Lift and Pitching Moment (b) Drag (c) Increments	56
1-22	Effect of Nose Strake Z76, YF-16, HT = 25° (a) Lift and Pitching Moment (b) Drag	59
1-23	Effect of Forebody Strake Forward Extent (Z63, Z64, Z72), YF-16 + 30.5 Stretch, HT = 0 (a) Lift and Pitching Moment (b) Drag (c) Increments	61
1-24	Effect of Forebody Strake Forward Extent (Z63, Z64, Z72), YF-16 + 30.5 Stretch, HT = 25° (a) Lift and Pitching Moment (b) Drag (c) Increments	64
1-25	Effect of Nose Strake Z74, YF-16 + 30.5 Stretch (a) Lift and Pitching Moment (b) Drag	67

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-26	Effect of Nose, Z74, and Canard, Z84, Strakes, YF-16 + 30.5 Stretch, HT = 0 (a) Lift and Pitching Moment (b) Drag	69
1-27	Effect of Canard Strake Z84, YF-16 + 30.5 Stretch, HT = 25° (a) Lift and Pitching Moment (b) Drag	71
1-28	Effect of Forebody Strake Shape (Z75, Z80, Z87), YF-16 + 30.5 Stretch, HT = 0 (a) Lift and Pitching Moment (b) Drag (c) Increments	73
1-29	Effect of Forebody Strake Shape (Z75, Z80, Z87), YF-16 + 30.5 Stretch, HT = 25° (a) Lift and Pitching Moment (b) Drag (c) Increments	76
1-30	Effect of Forebody Strake Z87, YF-16 + 30.5 Stretch (a) Lift and Pitching Moment (b) Drag	79
1-31	Effect of Forebody Strake Shape (Z88 and Z89), YF-16 + 30.5 Stretch, HT = 0 (a) Lift and Pitching Moment (b) Drag	81
1-32	Effect of Forebody Strake Forward Extent (Z63, Z87, Z101, Z106), YF-16 + 30.5 Stretch, HT = 0 (a) Lift and Pitching Moment (b) Drag (c) Increments	83
1-33	Effect of Forebody Strake Forward Extent (Z63, Z87, Z101, Z106), YF-16 + 30.5 Stretch, HT = 25° (a) Lift and Pitching Moment (b) Drag (c) Increments	86

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-34	Effect of Nose Strake Z100, YF-16 (a) Lift and Pitching Moment (b) Drag	89
1-35	Effect of Horizontal Tail Deflection with Strake Z103, F-16 with Wing W3BB (a) Lift and Pitching Moment (b) Drag	91
1-36	Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W3BB, HT = 0 (a) Lift and Pitching Moment (b) Drag	93
1-37	Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W3BB, HT = 25° (a) Lift and Pitching Moment (b) Drag	95
1-38	Effect of Horizontal Tail Deflection with Strake Z103, F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	97
1-39	Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W24, HT = 0 (a) Lift and Pitching Moment (b) Drag	99
1-40	Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W24, HT = 25° (a) Lift and Pitching Moment (b) Drag	101
1-41	Effect of Forebody Strake Shape (Z103, Z107-Z109), F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	103
1-42	Effect of Forebody Strake Forward Extent (Z103, Z109) with Nose Strake Z112, F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	105

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-43	Effect of Forebody Strake Shape (Z103, Z107-Z109) with Nose Strake Z112, F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	107
1-44	Effect of Nose Strake Z112 with Forebody Strake Z103, F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	109
1-45	Effect of Nose Strake Z112 with Forebody Strake Z109, F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	111
1-46	Effect of Canard Strake Z79, F-16 (a) Lift and Pitching Moment (b) Drag	113
1-47	Effect of Nose Strake Z124 with Nose Probe, F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	115
1-48	Effect of Nose Strake Z124 without Nose Probe, F-16 with Wing W24 (a) Lift and Pitching Moment (b) Drag	117
1-49	Effect of Nose Strake Z124, F-16, HT = 0 (a) Lift and Pitching Moment (b) Drag	119
1-50	Effect of Nose Strake Z124, F-16, HT = 25° (a) Lift and Pitching Moment (b) Drag	121
1-51	Effect of Nose Strakes Z123-Z127, F-16 (a) Lift and Pitching Moment (b) Drag	123
1-52	Effect of Nose Strake Inclination (Z124 and Z128), F-16	125

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
	(a) Lift and Pitching Moment (b) Drag	
1-53	Effect of Nose Strake Length (Z131, Z131A and Z131B), F-16 (a) Lift and Pitching Moment (b) Drag	127
1-54	Effect of Nose Strakes Z131 and Z132, F-16 (a) Lift and Pitching Moment (b) Drag	129
1-55	Effect of Nose Strake Z133, F-16 (a) Lift and Pitching Moment (b) Drag	131
1-56	Effect of Nose Shape, F-16 (a) Lift and Pitching Moment (b) Drag	133
2-1	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16 (a) Force and Moments, $\alpha = 21^\circ$ (b) Force and Moments, $\alpha = 31^\circ$	136
2-2	Effect of Forebody Strakes Z63-Z66, YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 26^\circ$ (b) Increments, $\alpha = 26^\circ$ (c) Force and Moments, $\alpha = 32^\circ$ (d) Increments, $\alpha = 32^\circ$ (e) Force and Moments, $\alpha = 36^\circ$ (f) Increments, $\alpha = 36^\circ$	138
2-3	Effect of Forebody Strake Forward Extent (Z63, Z64, Z72), YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 27^\circ$ (b) Increments, $\alpha = 27^\circ$ (c) Force and Moments, $\alpha = 33^\circ$ (d) Increments, $\alpha = 33^\circ$ (e) Force and Moments, $\alpha = 37^\circ$ (f) Increments, $\alpha = 37^\circ$	144

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
2-4	Effect of Strake Size (Z63 and Z66), YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 26^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 36^\circ$	150
2-5	Effect of Vertical Tail with Forebody Strake Z63, YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 26^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 36^\circ$	153
2-6	Effect of Vertical Tail with Forebody Strake Z66, YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 26^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 37^\circ$	156
2-7	Effect of Forebody Strake Z67-Z70, YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 26^\circ$ (b) Increments, $\alpha = 26^\circ$ (c) Force and Moments, $\alpha = 32^\circ$ (d) Increments, $\alpha = 32^\circ$ (e) Force and Moments, $\alpha = 37^\circ$ (f) Increments, $\alpha = 37^\circ$	159
2-8	Effect of Forebody Strake Size (Z67 and Z70), YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 26^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 37^\circ$	165
2-9	Effect of Fuselage Stretch, Z64 (30.5 Stretch) and Z68 (44.5 Stretch) (a) Force and Moments, $\alpha = 26^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 36^\circ$	168
2-10	Effect of Nose Strake Z74, YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 0$ (b) Force and Moments, $\alpha = 11^\circ$	171

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
2-11	Effect of Nose, Z74, and Canard, Z84, Strakes, YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 27^\circ$ (b) Force and Moments, $\alpha = 33^\circ$ (c) Force and Moments, $\alpha = 37^\circ$	173
2-12	Effect of Forebody Strake Shape (Z75, Z80, Z87), YF-16+30.5 Stretch (a) Force and Moments, $\alpha = 27^\circ$ (b) Force and Moments, $\alpha = 33^\circ$ (c) Force and Moments, $\alpha = 37^\circ$	176
2-13	Effect of Forebody Strake Size (Z63 and Z87), YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 0^\circ$ (b) Force and Moments, $\alpha = 11^\circ$ (c) Increments, $\alpha = 11^\circ$	179
2-14	Effect of Nose, Z76, and Canard, Z86, Strakes, YF-16 (a) Force and Moments, $\alpha = 27^\circ$ (b) Force and Moments, $\alpha = 33^\circ$ (c) Force and Moments, $\alpha = 37^\circ$	182
2-15	Effect of Nose (Z77) and Canard (Z79, Z82) Strakes, YF-16 (a) Force and Moments, $\alpha = 27^\circ$ (b) Increments, $\alpha = 27^\circ$ (c) Force and Moments, $\alpha = 33^\circ$ (d) Increments, $\alpha = 33^\circ$ (e) Force and Moments, $\alpha = 37^\circ$ (f) Increments, $\alpha = 37^\circ$	185
2-16	Effect of Forebody Strake Forward Extent (Z63, Z87, Z101, Z106), YF-16 + 30.5 Stretch (a) Force and Moments, $\alpha = 26^\circ$ (b) Increments, $\alpha = 26^\circ$	191
2-17	Effect of Nose Strake Z100, YF-16 (a) Force and Moments, $\alpha = 21^\circ$ (b) Force and Moments, $\alpha = 26^\circ$ (c) Force and Moments, $\alpha = 32^\circ$ (d) Force and Moments, $\alpha = 37^\circ$	193

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
2-18	Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W3BB (a) Force and Moments, $\alpha = 11^\circ$ (b) Force and Moments, $\alpha = 21^\circ$ (c) Force and Moments, $\alpha = 26^\circ$	197
2-19	Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W24	200
2-20	Effect of Wing with Forebody Strake Z103, F-16 (a) Force and Moments, $\alpha = 0$ and 11° (b) Force and Moments, $\alpha = 16$ and 21°	201
2-21	Effect of Leading Edge Flap Deflection with Forebody Strake Z103, F-16 with Wing W3BB (a) Force and Moments, $\alpha = 0$ and 11° (b) Force and Moments, $\alpha = 16$ and 21°	203
2-22	Effect of Forebody Strake Shape (Z103, Z107- Z109), F-16 with Wing W24 (a) Force and Moments, $\alpha = 27^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 37^\circ$ (d) Force and Moments, $\alpha = 42^\circ$	205
2-23	Effect of Forebody Strake (Z103 and Z109) Forward Extent with Nose Strake Z112, F-16 with Wing W24 (a) Force and Moments, $\alpha = 26^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 36^\circ$ (d) Force and Moments, $\alpha = 41^\circ$	209
2-24	Effect of Nose Strakes Z110-Z115, F-16 with Wing W24 (a) Force and Moments, $\alpha = 26^\circ$ (b) Increments, $\alpha = 26^\circ$ (c) Force and Moments, $\alpha = 32^\circ$ (d) Increments, $\alpha = 32^\circ$ (e) Force and Moments, $\alpha = 36^\circ$ (f) Increments, $\alpha = 36^\circ$ (g) Force and Moments, $\alpha = 41^\circ$ (h) Increments, $\alpha = 41^\circ$	213

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
2-25	Effect of Nose Strakes Z110 and Z117, F-16 with Wing W24 (a) Force and Moments, $\alpha = 26^\circ$ (b) Force and Moments, $\alpha = 32^\circ$ (c) Force and Moments, $\alpha = 36^\circ$ (d) Force and Moments, $\alpha = 41^\circ$	224
2-26	Effect of Forebody Strakes Z120 and Z121 with Canard Strake Z79, F-16 (a) Force and Moments, $\alpha = 27^\circ$, 30 and 32° (b) Force and Moments, $\alpha = 34^\circ$, 37 and 42°	225
2-27	Effect of Nose Strake Z124, F-16 (a) Force and Moments, $\alpha = -11^\circ$ (b) Force and Moments, $\alpha = 0^\circ$ (c) Force and Moments, $\alpha = 11^\circ$	227
2-28	Effect of Nose Strake Z124 with nose probe, F-16 with Wing W24 (a) Force and Moments, $\alpha = 25^\circ$, 27 and 29° (b) Force and Moments, $\alpha = 32^\circ$, 36 and 40°	230
2-29	Effect of Nose Strake Z124 without nose probe, F-16 with Wing W24 (a) Force and Moments, $\alpha = 25^\circ$, 27 and 30° (b) Force and Moments, $\alpha = 32^\circ$, 36 and 40°	232
2-30	Effect of Nose Strake Inclination Z124 and Z128), F-16 (a) Force and Moments, $\alpha = 27^\circ$ (b) Increments, $\alpha = 27^\circ$ (c) Force and Moments, $\alpha = 32^\circ$ (d) Increments, $\alpha = 32^\circ$ (e) Force and Moments, $\alpha = 37^\circ$ (f) Increments, $\alpha = 37^\circ$ (g) Force and Moments, $\alpha = 42^\circ$ (h) Increments, $\alpha = 42^\circ$	234
2-31	Effect of Nose Strakes Z123-Z127, F-16 (a) Force and Moments, $\alpha = 27^\circ$ (b) Increments, $\alpha = 27^\circ$ (c) Force and Moments, $\alpha = 36^\circ$ (d) Increments, $\alpha = 30^\circ$ (e) Force and Moments, $\alpha = 32^\circ$	242

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
	(f) Increments, $\alpha = 32^\circ$	
	(g) Force and Moments, $\alpha = 37^\circ$	
	(h) Increments, $\alpha = 37^\circ$	
	(i) Force and Moments, $\alpha = 42^\circ$	
	(j) Increments, $\alpha = 42^\circ$	
2-32	Effect of Nose Strake Length (Z131, Z131A, Z131B) F-16	252
	(a) Force and Moments, $\alpha = 26^\circ$	
	(b) Increments, $\alpha = 26^\circ$	
	(c) Force and Moments, $\alpha = 32^\circ$	
	(d) Increments, $\alpha = 32^\circ$	
	(e) Force and Moments, $\alpha = 38^\circ$	
	(f) Increments, $\alpha = 37^\circ$	
	(g) Force and Moments, $\alpha = 39^\circ$	
	(h) Increments, $\alpha = 39^\circ$	
2-33	Effect of Nose Strakes Z131 and Z132, F-16	260
	(a) Force and Moments, $\alpha = 26^\circ$	
	(b) Force and Moments, $\alpha = 32^\circ$	
	(c) Force and Moments, $\alpha = 37^\circ$	
	(d) Force and Moments, $\alpha = 39^\circ$	
2-34	Effect of Nose Strake Z133, F-16	264
	(a) Force and Moments, $\alpha = 26^\circ$	
	(b) Force and Moments, $\alpha = 32^\circ$	
	(c) Force and Moments, $\alpha = 37^\circ$	
	(d) Force and Moments, $\alpha = 39^\circ$	
2-35	Effect of Nose Shape, F-16	268
	(a) Force and Moments, $\alpha = 26^\circ$	
	(b) Force and Moments, $\alpha = 32^\circ$	
	(c) Force and Moments, $\alpha = 37^\circ$	
	(d) Force and Moments, $\alpha = 39^\circ$	
2-36	Effect of Nose Strake Z131 with Nose N7 and Vertical Tail Off, F-16	272
	(a) Force and Moments, $\alpha = 26^\circ$	
	(b) Force and Moments, $\alpha = 32^\circ$	
	(c) Force and Moments, $\alpha = 37^\circ$	
	(d) Force and Moments, $\alpha = 39^\circ$	
3-1	Effect of Canard Strake Z1, Configuration 401F-2 with Twin Vertical Tails, $M = 0.80$	278

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
	(a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	
3-2	Effect of Leading Edge Flap Deflection with Canard Strake Z1A, Configuration 401F-5, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	281
3-3	Effect of Canard Strake Z1A, Configuration 401F-5, LEF = 10°, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	284
3-4	Effect of Canard Strake Z1A, Configuration 401F-5, LEF = 25°, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	287
3-5	Effect of Canard Strake Z1A, Configuration 401F-2 with Twin Vertical Tails, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	290
3-6	Effect of Canard Strake Z1A, Configuration 401F-2 with Single Vertical Tail, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	293
3-7	Effect of Canard Strake Z1A, Configuration 401F-2 with Twin Vertical Tails, M = 1.20 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	296

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-8	Effect of Canard Strake Z2, Configuration 401F-2 with Twin Vertical Tails (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	299
3-9	Effect of Canard Strake Z3, Configuration 401F-4, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	302
3-10	Effect of Canard Strake Z3, Configuration 401F-4, $M = 0.90$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	305
3-11	Effect of Canard Strake Z3, Configuration 401F-4, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	308
3-12	Comparison of Canard Strakes (Z1A, Z1B, Z3), Configuration 401F-5, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	311
3-13	Comparison of Canard Strakes (Z1A, Z1B, Z3), Configuration 401F-5, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	314
3-14	Effect of Leading Edge Flap Deflection with Forebody Strake Z4, Configuration 401F-5, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	317

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-15	Effect of Leading Edge Flap Deflection without a Strake, Configuration 401F-5, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	320
3-16	Effect of Forebody Strake Z4, Configuration 401F-5, $LEF = 15^\circ$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	323
3-17	Effect of Forebody Strake Z4, Configuration 401F-5, $LEF = 25^\circ$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	326
3-18	Effect of Forebody - Strake Blending (Z4), Configuration 401F-5, $LEF = 0$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	329
3-19	Effect of Forebody - Strake Blending (Z4), Configuration 401F-5, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	332
3-20	Effect of Forebody Strake Blending (Z4), Configuration 401F-5, $LEF = 10^\circ$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	335
3-21	Effect of Forebody Strake Z4 and Z5, Configuration 401F-5, $LEF = 0$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	338

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-22	Effect of Forebody Strakes Z4 and Z5, Configuration 401F-5, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	342
3-23	Effect of Forebody Strakes Z4 and Z5, Configuration 401F-5, $LEF = 10^\circ$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	346
3-24	Effect of Delta Planform Forebody Strakes, (Z7-Z10), Configuration 785, $LEF = 0$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	350
3-25	Effect of Delta Planform Forebody Strakes (Z7-Z10) Configuration 785, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	354
3-26	Effect of Delta Planform Forebody Strakes (Z7, Z10) Configuration 785, $LEF = 5^\circ$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	358
3-27	Effect of Delta Planform Forebody Strakes (Z7, Z10), Configuration 785, $LEF = 15^\circ$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	362

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-28	Effect of Horizontal Tail Deflection with Forebody Strake Z7, Configuration 785, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	366
3-29	Effect of Horizontal Tail Deflection without a Strake, Configuration 785, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	369
3-30	Effect of Strake Z7 on Horizontal Tail Effectiveness, Configuration 785, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	372
3-31	Effect of Leading Edge Flap Deflection with Strake Z7, Configuration 785, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	376
3-32	Effect of Forebody Strake Z7, Configuration 786, LEF = 0, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	379
3-33	Effect of Forebody Strake Z7, Configuration 786, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	383

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-34	Effect of Forebody Strake Z7, Configuration 786, $LEF = 5^{\circ}$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	386
3-35	Effect of Ogee Planform Forebody Strakes (Z14, Z16-Z18), Configuration 401F-5, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	389
3-36	Effect of Forebody Chines (Z20, Z21) and Canard Strake Z1A, Configuration 401F-10A, $LEF = 0$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	39~
3-37	Effect of Forebody Chines (Z20, Z21) and Canard Strake Z1A, Configuration 401F-10A, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	396
3-38	Effect of Forebody Chines (Z20, Z21) and Canard Strake Z1A, Configuration 401F-10A, $LEF = 10^{\circ}$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	399
3-39	Effect of Forebody Chines (Z20, Z21), Configuration 401F-10A, $LEF = 25^{\circ}$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	402

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-40	Comparison of Forebody Strake Z22 with Canard Strake Z1A, Configuration 401F-5, LEF = 0, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	405
3-41	Comparison of Forebody Strakes Z22 and Z23 with Canard Strake Z1A, Configuration 401F-5, LEF = 10, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	408
3-42	Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 0, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	411
3-43	Effect of Forebody Strake Shape (Z24-Z26), Configuration 401F-10A, LEF = 0, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	415
3-44	Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 10°, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	419
3-45	Effect of Forebody Strake Shape (Z24-Z26), Configuration 401F-10A, LEF = 10°, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	423

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-46	Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 25° , M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	427
3-47	Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 0° , M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	431
3-48	Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 10° , M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	435
3-49	Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 25° , M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	439
3-50	Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 10° , M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	443
3-51	Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 25° , M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	446

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-52	Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 0, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	450
3-53	Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 10°, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	454
3-54	Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 25°, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	458
3-55	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, M = 0.60 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	462
3-56	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, LEF = 0, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	465
3-57	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	468

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-58	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	471
3-59	Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, $LEF = 25^\circ$, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	474
3-60	Effect of Forebody Strake Shape (Z33, Z48-Z50), Configuration 401F-16E, $M = 0.90$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	477
3-61	Effect of Forebody Strake Shape (Z63-Z66, Z71), YF-16 + 30.5 Stretch, $M = 0.80$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	480
3-62	Effect of Forebody Strake Shape (Z63-Z66, Z71, YF-16 + 30.5 Stretch, $LEF = 0$, $M = 0.90$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	484
3-63	Effect of Forebody Strake Shape (Z63-Z66, Z71), YF-16 + 30.5 Stretch, $M = 1.20$ (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	488

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-64	Effect of Forebody Strake Shape (Z63-Z66, Z71), YF-16 + 30.5 Sketch, LEF = 25° , M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	492
3-65	Effect of Forebody Strake Shape (Z63, Z64, Z87, Z88) YF-16 + 30.5 Stretch, M = 1.60 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	495
3-66	Effect of Forebody Strake Shape (Z63, Z64, Z87, Z88) YF-16 + 30.5 Stretch, M = 2.00 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	498
3-67	Effect of Nose Strakes Z73 and Z74, YF-16 + 30.5 Stretch, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	501
3-68	Effect of Nose Strakes Z73 and Z74, YF-16 + 30.5 Stretch, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	504
3-69	Effect of Nose Strakes Z73 and Z74, YF-16 + 30.5 Stretch, M = 1.20 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	507
3-70	Effect of Forebody Strake Size (Z72, Z75, Z80), YF-16 + 30.5 Stretch, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	510

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-71	Effect of Forebody Strake Size (Z72, Z75, Z80) YF-16 + 30.5 Stretch, LEF = 0, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	514
3-72	Effect of Forebody Strake Size (Z72, Z75, Z80) YF-16 + 30.5 Stretch, M = 1.20 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	518
3-73	Effect of Forebody Strake Size (Z72, Z75, Z80) YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	522
3-74	Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, M = 0.80 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	526
3-75	Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	529
3-76	Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, M = 1.20 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	532

LIST OF FIGURES

(Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
3-77	Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, LEF = 25° , M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	535
3-78	Effect of Nose Strake Z100, F-16, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	538
3-79	Effect of Forebody Strake Shape (Z103, Z108), F-16, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	541
3-80	Effect of Forebody Strake Shape (Z103, Z108), F-16, M = 1.20 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale	544
3-81	Effect of Forebody Strake Forward Extent (Z103, Z109), F-16, M = 0.90 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	547
3-82	Effect of Forebody Strake Forward Extent (Z103, Z109), F-16, M = 1.20 (a) Lift and Pitching Moment (b) Drag, Large Scale (c) Drag, Small Scale (d) Increments	551
4-1	Effect of Canard Strake Z1, Configuration 401F-2 with Twin Vertical Tails, M = 0.80 (a) Force and Moments, $\alpha = 16^{\circ}$ (b) Force and Moments, $\alpha = 27^{\circ}$	556

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-2	Effect of Canard Strake Z1A, Configuration 401F-2 with 7.5° Twin Vertical Tails, M = 0.80	558
4-3	Effect of Canard Strake Z1A, Configuration 401F-2 with 7.5° Twin Vertical Tails, M = 1.20	559
4-4	Effect of Canard Strake Z1A, Configuration 401F-2 with 15° Twin Vertical Tails, M = 1.20 (a) Force and Moments, $\alpha = 0^\circ$ (b) Force and Moments, $\alpha = 15^\circ$ (c) Force and Moments, $\alpha = 20^\circ$	560
4-5	Effect of Canard Strake Z1A, Configuration 401F-2 with 15° Twin Vertical Tails, LEF = 25°, M = 0.80 (a) Force and Moments, $\alpha = 15^\circ$ (b) Force and Moments, $\alpha = 21^\circ$ (c) Force and Moments, $\alpha = 24^\circ$	563
4-6	Effect of Canard Strake Z1A, Configuration 401F-2 with Single Vertical Tail, LEF = 25°, M = 0.80 (a) Force and Moments, $\alpha = 15^\circ$ (b) Force and Moments, $\alpha = 21^\circ$ (c) Force and Moments, $\alpha = 24^\circ$	566
4-7	Effect of Canard Strake Z1A, Configuration 401F-5, LEF = 25°, M = 0.80 (a) Force and Moments, $\alpha = 15^\circ$ (b) Force and Moments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$	569
4-8	Effect of Forward Vertical Tail Movement with Canard Strake Z1A, Configuration 401F-5, M = 1.20 (a) Force and Moments, $\alpha = 10^\circ$ (b) Force and Moments, $\alpha = 15^\circ$	572
4-9	Effect of Forward Vertical Tail Movement with Canard Strake Z1A, Configuration 401F-5, LEF = 10°, M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$	574

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-10	Effect of Forward Vertical Tail Movement with Canard Strake Z1A, Configuration 401F-5, $LEF = 25^\circ$, $M = 0.80$ (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$	576
4-11	Effect of Canard Strake Z2, Configuration 401F-2 with Twin Vertical Tails, $M = 0.80$	578
4-12	Effect of Canard Strakes Z1B and Z3, Configuration 401F-4, $M = 0.80$ (a) Force and Moments, $\alpha = 16^\circ$ (b) Force and Moments, $\alpha = 19^\circ$ (c) Force and Moments, $\alpha = 25^\circ$	579
4-13	Effect of Canard Strake Z3, Configuration 401F-4, $M = 0.90$	582
4-14	Effect of Canard Strakes Z1B and Z3, Configuration 401F-4, $M = 1.20$ (a) Force and Moments, $\alpha = 11^\circ$ (b) Force and Moments, $\alpha = 15^\circ$	583
4-15	Comparison of Canard Strakes (Z1A, Z1B, Z3), Configuration 401F-5, $M = 1.20$ (a) Force and Moments, $\alpha = 10^\circ$ (b) Force and Moments, $\alpha = 15^\circ$	585
4-16	Comparison of Canard Strakes (Z1A, Z1B, Z3), Configuration 401F-5, $M = 0.80$ (a) Force and Moments, $\alpha = 15^\circ$ (b) Force and Moments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$	587
4-17	Effect of Forebody - Strake Blending (Z4), Configuration 401F-5, $M = 0.80$ (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	590

LIST OF FIGURES

(Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-18	Effect of Forebody Strakes Z4 and Z5, Configuration 401F-5, $M = 1.20$ (a) Force and Moments, $\alpha = 10^\circ$ (b) Increments, $\alpha = 10^\circ$ (c) Force and Moments, $\alpha = 15^\circ$ (d) Increments, $\alpha = 15^\circ$	594
4-19	Effect of Forebody Strakes Z4 and Z5, Configuration 401F-5, $LEF = 10^\circ$, $M = 0.80$ (a) Force and Moments, $\alpha = 15^\circ$ (b) Increments, $\alpha = 15^\circ$ (c) Force and Moments, $\alpha = 20^\circ$ (d) Increments, $\alpha = 20^\circ$ (e) Force and Moments, $\alpha = 25^\circ$ (f) Increments, $\alpha = 25^\circ$	598
4-20	Effect of Forebody Strake Z4, Configuration 401F-5, $LEF = 15^\circ$, $M = 0.80$ (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$	604
4-21	Effect of Forebody Strake Z4 on Vertical Tail Effectiveness, Configuration 401F-5, $M = 0.80$ (a) Force and Moments, $\alpha = 20^\circ$ (b) Strake-off Increments, $\alpha = 20^\circ$ (c) Strake-on Increments, $\alpha = 20^\circ$ (d) Force and Moments, $\alpha = 25^\circ$ (e) Strake off Increments, $\alpha = 25^\circ$ (f) Strake on Increments, $\alpha = 25^\circ$	606
4-22	Effect of Forebody Strake Z5, Configuration 401F-4, $M = 0.80$ (a) Force and Moments, $\alpha = 16^\circ$ (b) Force and Moments, $\alpha = 20^\circ$ (c) Increments, $\alpha = 20^\circ$ (d) Force and Moments, $\alpha = 25^\circ$ (e) Increments, $\alpha = 25^\circ$	612

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-23	Effect of Forebody Strake Z5, Configuration 401F-4, $M = 1.20$ (a) Force and Moments, $\alpha = 11^\circ$ (b) Increments, $\alpha = 11^\circ$ (c) Force and Moments, $\alpha = 15^\circ$ (d) Increments, $\alpha = 15^\circ$	617
4-24	Effect of Delta Planform Forebody Strakes (Z7-Z10), Configuration 785, $LEF = 0$, $M = 0.80$ (a) Force and Moments, $\alpha = 14^\circ$ (b) Increments, $\alpha = 14^\circ$ (c) Force and Moments, $\alpha = 20^\circ$ (d) Increments, $\alpha = 20^\circ$ (e) Force and Moments, $\alpha = 24^\circ$ (f) Increments, $\alpha = 24^\circ$	621
4-25	Effect of Delta Planform Forebody Strakes (Z7-Z10), Configuration 785, $M = 1.20$ (a) Force and Moments, $\alpha = 12^\circ$ (b) Increments, $\alpha = 12^\circ$ (c) Force and Moments, $\alpha = 17^\circ$ (d) Increments, $\alpha = 17^\circ$	627
4-26	Effect of Delta Planform Forebody Strakes (Z7,Z10), Configuration 785, $LEF = 5^\circ$, $M = 0.80$ (a) Force and Moments, $\alpha = 14^\circ$ (b) Force and Moments, $\alpha = 20^\circ$ (c) Increments, $\alpha = 20^\circ$ (d) Force and Moments, $\alpha = 24^\circ$ (e) Increments, $\alpha = 24^\circ$	631
4-27	Effect of Delta Planform Forebody Strakes (Z7,Z10), Configuration 785, $LEF = 10^\circ$, $M = 0.80$ (a) Force and Moments, $\alpha = 14^\circ$ (b) Increments, $\alpha = 14^\circ$ (c) Force and Moments, $\alpha = 20^\circ$ (d) Increments, $\alpha = 20^\circ$ (e) Force and Moments, $\alpha = 24^\circ$ (f) Increments, $\alpha = 24^\circ$	636

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-28	Effect of Delta Planform Forebody Strakes (Z7, Z10) Configuration 785, LEF = 15° , M = 0.80 (a) Force and Moments, $\alpha = 14^\circ$ (b) Increments, $\alpha = 14^\circ$ (c) Force and Moments, $\alpha = 19^\circ$ (d) Increments, $\alpha = 19^\circ$ (e) Force and Moments, $\alpha = 24^\circ$ (f) Increments, $\alpha = 24^\circ$	642
4-29	Effect of Forebody Strake Z7, Configuration 786, M = 1.20	648
4-30	Effect of Forebody Strake Z7, Configuration 786, LEF = 5° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	649
4-31	Effect of Forebody Strake Z7, Configuration 786, LEF = 10° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	653
4-32	Effect of Forebody Strake Z7, Configuration 786, LEF = 15° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	657
4-33	Effect of Ogee Planform Forebody Strakes (Z14, Z16, Z18), Configuration 401F-5, M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	661

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-34	Effect of Forebody Chines (Z20, Z21) and Canard Strake Z1A, Configuration 401F-10A, LEF = 10° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$	665
4-35	Effect of Forebody Chine Z20, Configuration 401F-10A, LEF = 25° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$	667
4-36	Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 10° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	669
4-37	Effect of Forebody Strake Shape (Z24-Z26), Configuration 401F-10A, M = 0.90 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	673
4-38	Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 25° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	677
4-39	Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 10° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$ (c) Increments, $\alpha = 25^\circ$	681
4-40	Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 25° , M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$ (b) Increments, $\alpha = 20^\circ$ (c) Force and Moments, $\alpha = 25^\circ$ (d) Increments, $\alpha = 25^\circ$	684

LIST OF FIGURES (Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-41	Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 10° , M = 0.80 (a) Force and Moments, $\alpha = 20^{\circ}$ (b) Force and Moments, $\alpha = 25^{\circ}$	688
4-42	Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 25° , M = 0.80 (a) Force and Moments, $\alpha = 20^{\circ}$ (b) Force and Moments, $\alpha = 25^{\circ}$	690
4-43	Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 10° , M = 0.80 (a) Force and Moments, $\alpha = 20^{\circ}$ (b) Increments, $\alpha = 20^{\circ}$ (c) Force and Moments, $\alpha = 25^{\circ}$ (d) Increments, $\alpha = 25^{\circ}$	692
4-44	Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 25° , M = 0.80 (a) Force and Moments, $\alpha = 20^{\circ}$ (b) Increments, $\alpha = 20^{\circ}$ (c) Force and Moments, $\alpha = 25^{\circ}$ (d) Increments, $\alpha = 25^{\circ}$	696
4-45	Effect of Forebody Strake Shape (Z63-Z66, Z71), YF-16 + 30.5 Stretch, LEF = 0, M = 0.90 (a) Force and Moments, $\alpha = 10^{\circ}$ (b) Increments, $\alpha = 10^{\circ}$	700
4-46	Effect of Forebody Strake Shape (Z63-Z66, Z71), YF-16 + 30.5 Stretch, LEF = 25° , M = 0.90 (a) Force and Moments, $\alpha = 25^{\circ}$ (b) Increments, $\alpha = 25^{\circ}$	702
4-47	Effect of Forebody Strake Size (Z72, Z75, Z80), YF-16 + 30.5 Stretch, LEF = 0° , M = 0.90 (a) Force and Moments, $\alpha = 10^{\circ}$ (b) Increments, $\alpha = 10^{\circ}$	704

LIST OF FIGURES

(Continued)

<u>Figure</u>	<u>Title</u>	<u>Page</u>
4-48	Effect of Forebody Strake Size (Z72, Z75, Z80), YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90 (a) Force and Moments, $\alpha = 25^\circ$ (b) Increments, $\alpha = 25^\circ$	706
4-49	Effect of Nose Strakes Z73 and Z74, YF-16 + 30.5 Stretch, LEF = 0, M = 0.90	708
4-50	Effect of Nose Strakes Z73 and Z74, YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90	709
4-51	Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, LEF = 0, M = 0.90	710
4-52	Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90	711
4-53	Effect of Nose Strake Z100, F-16, M = 0.90 (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$	712
4-54	Effect of Nose Strake Z124, F-16, M = 1.20 (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 25^\circ$ (c) Force and Moments, $\alpha = 30^\circ$	714
4-55	Effect of Nose Strake Z124, F-16, M = 2.00 (a) Force and Moments, $\alpha = 0^\circ$ (b) Force and Moments, $\alpha = 10^\circ$ (c) Force and Moments, $\alpha = 17^\circ$	717
4-56	Effect of Nose Strake Z128, F-16, M = 1.20 (a) Force and Moments, $\alpha = 20^\circ$ (b) Force and Moments, $\alpha = 30^\circ$	720

INTRODUCTION

The YF-16 and F-16 developmental wind tunnel test program has been reviewed and all force data pertinent to the design of forebody and nose strakes extracted. Volume I of this report (NASA CR-3053) contains the strake geometrical descriptions, general comments, representative data, and the initial analysis efforts towards the development of design guides for the application of strakes to future aircraft. This volume contains a complete set of the strake data. A few brief comments follow to orient the reader.

All geometrical data are supplied in Section 3 of Volume I. Table 4 of Volume I is duplicated in this volume as Table 1. It summarizes the test conditions for each strake configuration and shows the applicable figure numbers. All pitch data are referred to the stability axis system and all sideslip data are referred to the body axis system. Coefficients are referenced to an area of 26 square meters (280 square feet) and 25 percent of the mean aerodynamic wing chord unless otherwise noted. Some of the later data are noted as being referenced to an area of 27.9 square meters (300 square feet) and 35 percent of the mean aerodynamic wing chord.

The data are separated into four sections; low-speed pitch, low-speed sideslip, transonic pitch, and transonic sideslip. They are presented in a comparative plot format. Strakes are compared to strake-off configurations when available; otherwise, they are compared to other strakes of the same family. Within each section the data are presented by strake designation number in ascending order within the limits of the comparative plot format. Incremental plots are included for selected comparisons.

Table 1- TEST PARAMETERS

STRAKE	WING	CONFIGURATION (1) (2)	LOW SPEED												TRANSONIC																VOLUME II FIGURE NUMBERS							
			PITCH						SIDESLIP		PITCH												SIDESLIP															
			LEF	IT					LEF	HT	LEF	HT							LEF	HT																		
0	15	25	35	OFF	-25	-20	-10	0	25	0	25	0	25	0	5	10	15	25	-30	-20	-10	0	.6	.8	.9	1.2	1.6	2.0	0	5	10	15	25	0	.8	.9	1.2	2.0
21	W3	401F-2(TV)																x					x	x								x	x	x				3-1, 4-1
21A	W3	401F-5														x	x	x					x	x			x			x	x	x	x				3-2, 3-3, 3-4, 3-12, 3-13, 3-40, 3-41, 4-7, 4-8, 4-9, 4-10, 4-15, 4-16	
		401F-2(TV@15°)														x		x					x	x			x			x	x	x				3-5, 3-7, 4-4, 4-5		
		401F-2																x					x	x						x	x	x				3-6, 4-6		
		401F-2(TV@7.5)																										x			x	x	x				4-2, 4-3	
		401F-10A															x	x						x	x			x			x	x				3-36, 3-37, 3-38, 4-34		
21B	W3	401F-5														x							x	x			x			x	x	x				3-12, 3-13, 4-15, 4-16		
		401F-4(TV)																									x			x	x	x				4-12, 4-14		
21D	W3BB	YF-16+30.5Str.														x		x					x	x	x	x			x		x	x				3-74, 3-75, 3-76, 3-77, 4-51 4-52		
22	W3	401F-2(TV)														x							x	x					x			x	x				3-8, 4-11	
23	W3	401F-4(TV)														x							x	x	x	x			x			x	x				3-9, 3-10, 3-11, 4-12, 4-13, 4-14	
		401F-5																					x	x			x			x	x	x				3-12, 3-13, 4-15, 4-16		
24	W3	401F-5														x	x	x	x				x	x			x			x	x	x	x				3-14, 3-16, 3-17, 3-18, 3-19 3-20, 3-21, 3-22, 3-23, 4-17 4-18, 4-19, 4-20, 4-21	
24A	W3	401F-5														x		x					x	x			x			x	x					3-18, 3-19, 3-20, 4-17		
24B	W3	401F-5														x		x					x	x			x			x	x					3-18, 3-19, 3-20, 4-17		
25	W3	401F-5														x	x						x	x			x			x	x					3-21, 3-22, 3-23, 4-18, 4-19		
		401F-4(TV)																									x			x	x	x				4-22, 4-23		
27	W6	785														x	x	x		x	x	x	x	x			x			x	x	x	x			3-24, 3-25, 3-26, 3-27, 3-28 3-30, 4-24, 4-25, 4-26, 4-27 4-28		
		786(TV)															x	x	x				x	x			x			x	x	x	x			3-31, 3-32, 3-33, 3-34, 4-29 4-30, 4-31, 4-32, 4-58		
28	W6	785														x							x	x			x			x	x					3-24, 3-25, 4-24, 4-25		
29	W6	785														x							x	x			x			x	x					3-24, 3-25, 4-24, 4-25		
210	W6	785														x	x	x					x	x			x			x	x				3-24, 3-25, 3-26, 3-27, 4-24, 4-25, 4-26, 4-27, 4-28			
214	W3	401F-5																x					x	x					x			x	x				3-35, 4-33	
216	W3	401F-5																x					x	x					x			x	x				3-35, 4-33	
217	W3	401F-5																x					x	x					x			x	x				3-35, 4-33	
218	W3	401F-5																x					x	x					x			x	x				3-35, 4-33	
220	W3	401F-10A														x	x	x					x	x			x			x	x	x	x				3-36, 3-37, 3-38, 3-39, 4-34, 4-35	
221	W3	401F-10A														x	x	x					x	x			x			x	x	x	x				3-36, 3-37, 3-38, 3-39, 4-34, 4-35	

2

ORIGINAL PAGE IS
OF POOR QUALITY

Table 1 (Continued)

STRAKE	WING	CONFIGURATION	LOW SPEED												TRANSONIC																				VOLUME II FIGURE NUMBERS			
			PITCH						SIDESLIP		PITCH										SIDESLIP																	
			LEF			HT			0	25	LEF			HT			MACH										LEF			HT			MACH					
			0	15	25	35	OFF	-25			-20	-10	0	25	0	5	10	15	25	-30	-20	-10	0	.6	.8	.9	1.2	1.6	2.0	0	5	10	15	25		0	.8	.9
Z22	W3	401F-5				x																																1-1,1-2,3-40,3-41
Z22A	W3	401F-5				x																																1-1,1-2
Z23	W3	401F-5																																				3-40,3-41
Z24	W3	401F-10A																																				3-42,3-43,3-44,3-45,3-46
Z25	W3	401F-10A																																				4-36,4-37,4-38
Z26	W3	401F-10A																																				3-42,3-43,3-44,3-45,3-46
Z27	W3	401F-10A																																				4-36,4-37,4-38
Z28	W3	401F-16																																				3-42,3-44,3-45,3-46,4-36
Z29	W3	401F-16				x																																4-37
Z29A	W3	401F-16				x																																1-3,3-47,3-48,3-49,4-39,4-40
Z30	W3	401F-16				x																																3-47,3-48,3-49,3-50,3-51,4-39,4-40,4-41,4-42
Z31	W3	401F-16																																				1-3
Z32	W3	401F-16																																				3-47,3-48,3-49,4-39,4-40
Z33	W3	401F-16																																				3-47,3-48,3-49,3-52,3-53,3-54,4-39,4-40,4-43,4-44
Z33	W3	401F-16	x	x	x					x	x	x	x	x	x																						3-50,3-51,4-41,4-42	
Z33	W3BB	401F-16E																																				1-5,1-6,1-8,1-9,2-1,3-52,3-53,3-54,4-43,4-44
Z33A	W3	401F-16				x				x																												3-55,3-56,3-57,3-58,3-59,3-60
Z33A'	W3	401F-16				x				x																												1-5
Z33B	W3	401F-16				x				x																												1-4
Z33B'	W3	401F-16				x				x																												1-5
Z33C	W3	401F-16				x				x	x																											1-4
Z33D	W3	401F-16				x				x																												1-5,1-7
Z33E	W3	401F-16				x				x																												1-5
Z33F	W3	401F-16				x				x																												1-6
Z33G	W3	401F-16				x				x																												1-6
Z33H	W3	401F-16				x				x																												1-6
Z33I	W3	401F-16				x																																1-7
Z48	W3BB	401F-16E																																				3-60
Z49	W3BB	401F-16E																																				3-60
Z50	W3	401F-16	x	x					x		x		x	x																								1-8,1-9,2-1
	W3BB	401F-16E																																				3-55,3-56,3-57,3-58,3-59,3-60
Z55	W3BB	YF-16	x																																			1-10

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Table 1 (Continued)

STAKE	WING	CONFIGURATION	LOW SPEED											TRANSONIC																										VOLUME II FIGURE NUMBERS	
			PITCH											SIDESLIP		PITCH											SIDESLIP														
			LEF					RT						LEF	RT	LEF					RT						MACH						LEF				RT		MACH		
			0	15	25	35	OFF	-25	-20	-10	0	25	0	25	0	5	10	15	25	-30	-20	-10	0	.6	.8	.9	1.2	1.6	2.0	0	5	10	15	25	0	.8	.9	1.2	2.0		
256	W3BB	YF-16	x								x																											1-10			
257	W3BB	YF-16	x								x																											1-11			
258	W3BB	YF-16	x								x																											1-11			
263	W3BB	YF-16+30.5Ser	x		x		x	x			x	x	y									x		x	x	x	x	x	x				x	x		x		1-12, 1-14, 1-15, 1-16, 1-23, 1-24, 1-25, 1-26, 1-27, 1-30, 1-32, 1-33, 1-34, 3-61, 3-62, 3-63, 3-64, 3-65, 3-66, 3-67, 3-68, 3-69, 3-70, 3-71, 3-72, 3-73, 3-74, 4-45, 4-46, 4-49, 4-50, 4-51, 4-52 2-3, 2-4, 2-10, 2-11, 2-13, 2-16			
		YF-16+30.5Ser TH6										x	x	x																											
264	W3BB	YF-16+30.5Ser	x		x						x	x										x		x	x	x	x	x	x				x	x			1-12, 1-17, 1-18, 1-23, 1-24, 2-2, 2-9, 3-61, 3-62, 3-63, 3-64, 3-65, 3-66, 4-45, 4-46				
		YF-16+30.5Ser TH6			x						x																											2-3			
265	W3BB	YF-16+30.5Ser			x						x	x	f									x		x	x	x		x					x	x		1-12, 2-2, 3-61, 3-62, 3-63, 3-64, 4-45					
266	W3BB	YF-16+30.5Ser	x		x		x				x	x	x									x		x	x	x		x					x	x		x	1-12, 1-14, 1-15, 1-16, 2-2, 3-61, 3-62, 3-63, 3-64, 4-45, 4-46				
		YF-16+30.5Ser TH6										x	x																									2-4, 2-6			
267	W3BB	YF-16+44.5Ser	x		x						x	x																									1-13, 1-19, 1-20, 2-7				
		YF-16+44.5Ser TH6										x	x																									2-8			
268	W3BB	YF-16+44.5Ser	x		x						x	x																									1-13, 1-17, 1-18, 2-7, 2-9				
269	W3BB	YF-16+44.5Ser			x						x	x																									1-13, 2-7				
270	W3BB	YF-16+44.5Ser	x		x						x	x																									1-13, 1-19, 1-26, 2-7				
		YF-16+44.5Ser TH6										x	x																									2-8			
271	W3BB	YF-16+30.5Ser												x			x					x		x	x	x		x					x	x	x	3-61, 3-62, 3-63, 3-64, 4-45, 4-46					
272	W3BB	YF-16+30.5Ser			x						x	x	x				x					x		x	x	x		x					x	x	x	1-23, 1-24, 2-3, 3-70, 3-71, 3-72, 3-73, 4-47, 4-48					
273	W3BB	YF-16+30.5Ser												x			x					x		x	x	x		x					x	x	x	3-67, 3-68, 3-69, 4-49, 4-50					
274	W3BB	YF-16+30.5Ser	x		x						x	x	x	x	x							x		x	x	x		x					x	x	x	1-25, 1-26, 2-10, 2-11, 3-67, 3-68, 3-69, 4-49, 4-50					
275	W3BB	YF-16+30.5Ser			x						x	x	x				x					x		x	x	x		x					x	x	x	1-28, 1-29, 2-12, 3-70, 3-71, 3-72, 3-73, 4-47, 4-48					
276	W3BB	YF-16			x						x	x																									1-21, 1-22, 2-14				
277	W3BB	YF-16										x	x																								2-15				
279	W3BB	YF-16										x	x																								2-15				

Table 1 (Continued)

STRAKE	WING	CONFIGURATION	LOW SPEED													TRANSONIC																			VOLUME II FIGURE NUMBERS				
			PITCH							SIDESLIP			PITCH							SIDESLIP																			
			LEF			HT				LEF		HT	LEF			HT				MACH			LEF			HT			MACH										
			0	15	25	35	OFF	-25	-20	-10	0	25	0	25	0	5	10	15	25	-30	-20	-10	0	0.6	0.8	0.9	1.2	1.6	2.0	0	5	10	15	25		0	0.8	0.9	1.2
Z80	W3BB	YF-16+30.5Str		x						x	x		x	x		x					x		x	x	x			x				x	x	x				1-28,1-29,2-12,3-70,3-71,3-72,3-73,4-47,4-48	
Z81	W3BB	YF-16+30.5Str												x				x				x		x	x	x			x				x	x	x				3-74,3-75,3-76,3-77,4-51,4-52
Z82	W3BB	YF-16										x	x																										2-15
Z84	W3BB	YF-16+30.5Str		x							x	x		x	x																								1-26,1-27,2-11
Z86	W3BB	YF-16		x							x			x	x																								1-21,2-14
Z87	W3BB	YF-16+30.5Str	x	x							x	x	x	x	x	x						x					x	x											1-28,1-29,1-30,1-32,1-33,2-12,2-13,2-16,3-65,3-66
Z88	W3BB	YF-16+30.5Str	x									x					x					x					x	x											1-31,1-57,3-65,3-66
Z89	W3BB	YF-16+30.5Str	x									x																											1-31
Z100	W3BB	YF-16		x							x	x		x	x																								1-34,2-17
	W24	F-16															x					x												x	x	x			3-78,4-53
Z101	W3BB	YF-16+30.5Str		x							x	x		x	x																								1-32,1-33,2-16
Z102	W3BB	YF-16																																					2-17
Z103	W3BB	F-16	x	x							x	x	x	x	x	x						x				x	x												1-35,1-36,1-37,2-18,2-20,2-21,3-78,3-79,3-80,3-81,3-82,4-53
	W24	F-16	x	x							x	x	x	x	x																								1-38,1-39,1-40,1-41,1-44,2-19,2-20,2-22
		F-16+Z112		x								x		x	x																								1-42,1-43,2-23
Z104	W3BB	F-16		x							x	x		x	x																								1-36,1-37,2-18
	W24	F-16		x							x	x		x	x																								1-39,1-40,2-19
Z105	W3BB	F-16		x							x	x		x	x																								1-36,1-37,2-18
	W24	F-16		x							x	x		x	x																								1-39,1-40,2-19
Z106	W3BB	F-16+30.5Str		x							x	x		x	x																								1-32,1-33,2-16
Z107	W24	F-16		x								x			x	x																							1-41,2-22
		F-16+Z112		x								x																											1-43
Z108	W24	F-16		x								x		x	x	x						x				x	x												1-41,2-22,3-79,3-80
		F-16+Z112		x								x																											1-43
Z109	W24	F-16		x								x					x					x				x	x												1-41,1-45,3-81,3-82
		F-16+Z112		x								x																											1-42,1-43
Z110	W24	F-16											x	x																									2-24,2-25
Z111	W24	F-16											x	x																									2-24
Z112	W24	F-16		x								x		x	x																								1-44,1-45,2-24
Z113	W24	F-16											x	x																									2-24
Z114	W24	F-16											x	x																									2-24
Z115	W24	F-16											x	x																									2-24
Z117	W24	F-16											x	x																									2-25
Z120	W24	F-16		x							x	x	x	x	x																								1-46,1-47,1-48,1-49,1-50,2-26,2-27,2-28,2-29,2-30,2-31

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Table 1 (Continued)

STRAKE	WING	CONFIGURATION	LOW SPEED												TRANSONIC																				VOLUME 11 FIGURE NUMBERS		
			PITCH								SIDESLIP		PITCH										SIDESLIP														
			LEF	HT							LEF	HT	LEF	HT	MACH						LEF	HT	MACH														
0	15	25	35	OFF	-25	-20	-10	0	25	0	25	0	5	10	15	25	-30	-20	-10	0	.6	.8	.9	1.2	1.6	2.0	0	5	10	15	25	0	.8	.9	1.2	2.0	
Z121	W25	F-16									x	x																									2-26
Z123	W25	F-16		x							x	x	x																								1-51,2-31
Z124	W24 W25	F-16		x							x	x	x	x	x							x					x	x									1-47,1-48,1-49,1-50,1-52 2-27,2-28,2-29,2-30,4-54 4-55
Z125	W25	F-16		x							x	x	x																								1-51,2-31
Z126	W25	F-16		x							x	x	x																								1-51,2-31
Z127	W25	F-16		x							x	x	x																								1-51,2-31
Z128	W25	F-16		x							x	x	x														x					x					1-52,2-30,4-56
Z131	W25	F-16		x							x	x	x																								1-53,1-54,2-32,2-33,2-36
Z131A	W25	F-16									x	x																									2-32
Z131B	W25	F-16									x	x																									2-32
Z132	W25	F-16		x							x	x	x																								1-54,2-33
Z133	W25	F-16		x							x	x	x																								1-55,2-34

NOTES:

- (1) Configurations have single vertical tail unless noted as twin vertical (TV)
 (2) The YF-16 fuselage was stretched 25.4 cm (10 in) for the F-16

1. LOW SPEED PITCH DATA

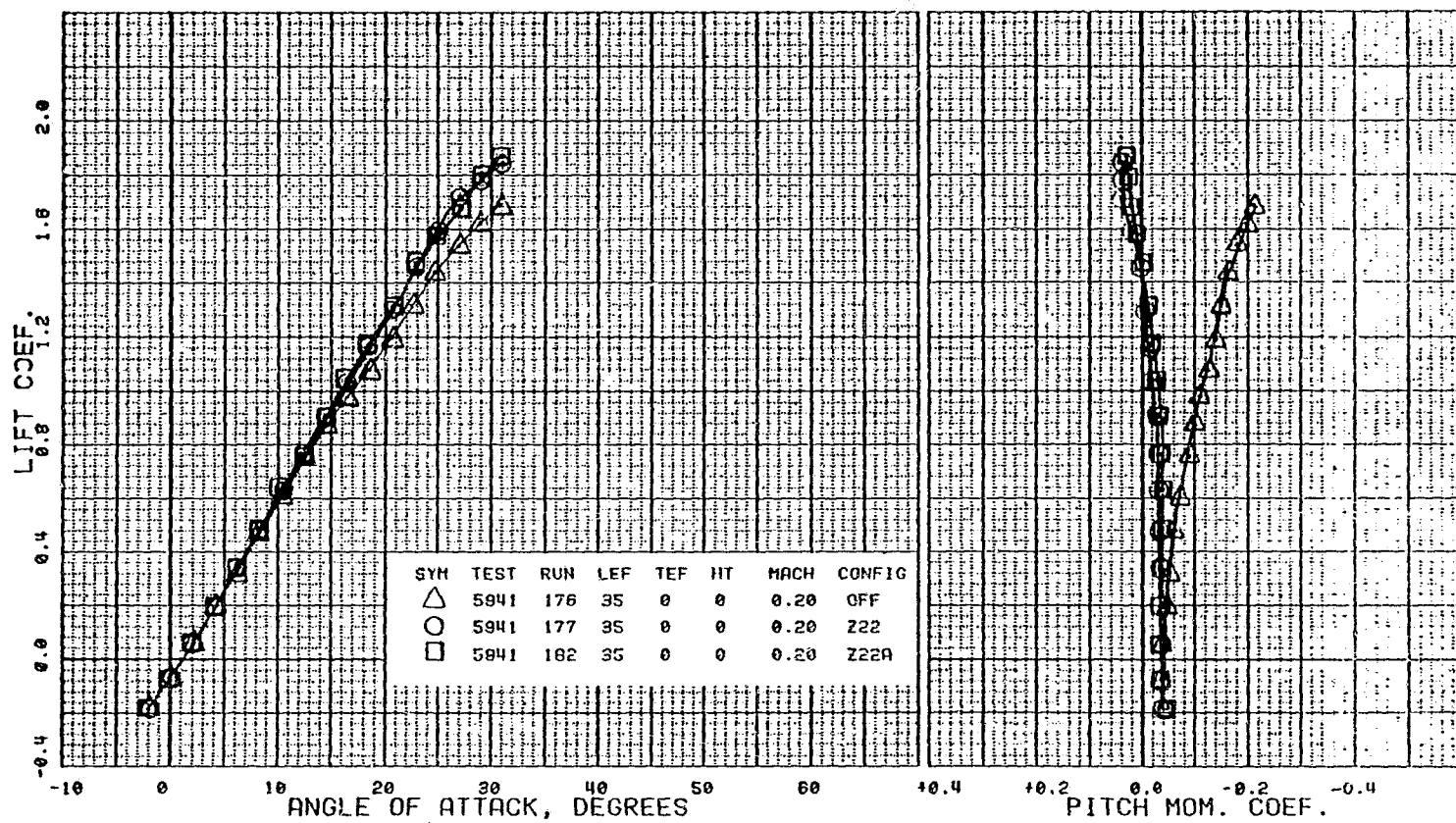


Figure 1-1 Effect of Slotted Strake Z22A, Configuration 401F-5, HT=0
(a) Lift and Pitching Moment

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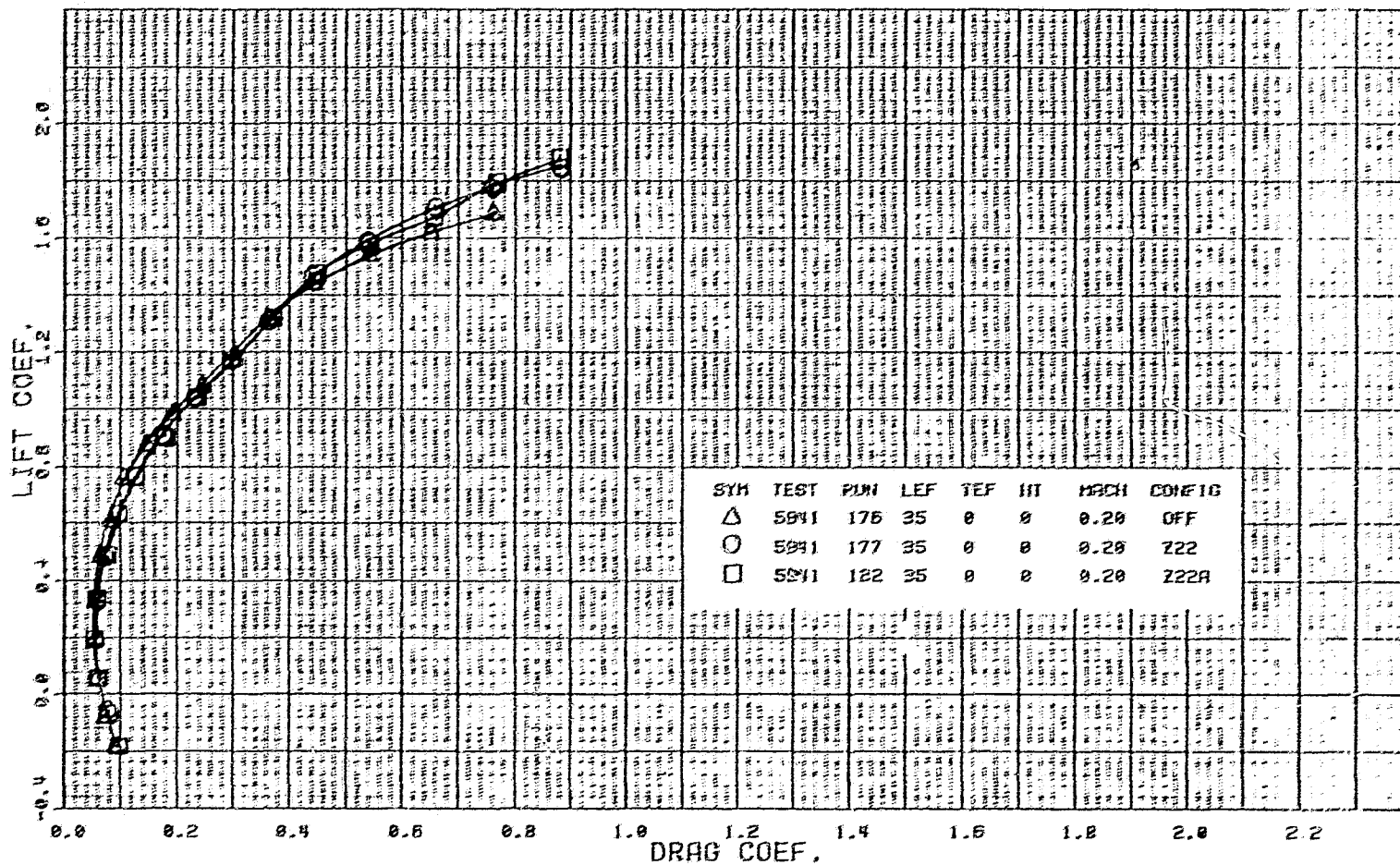


Figure 1-1 (b) Drag

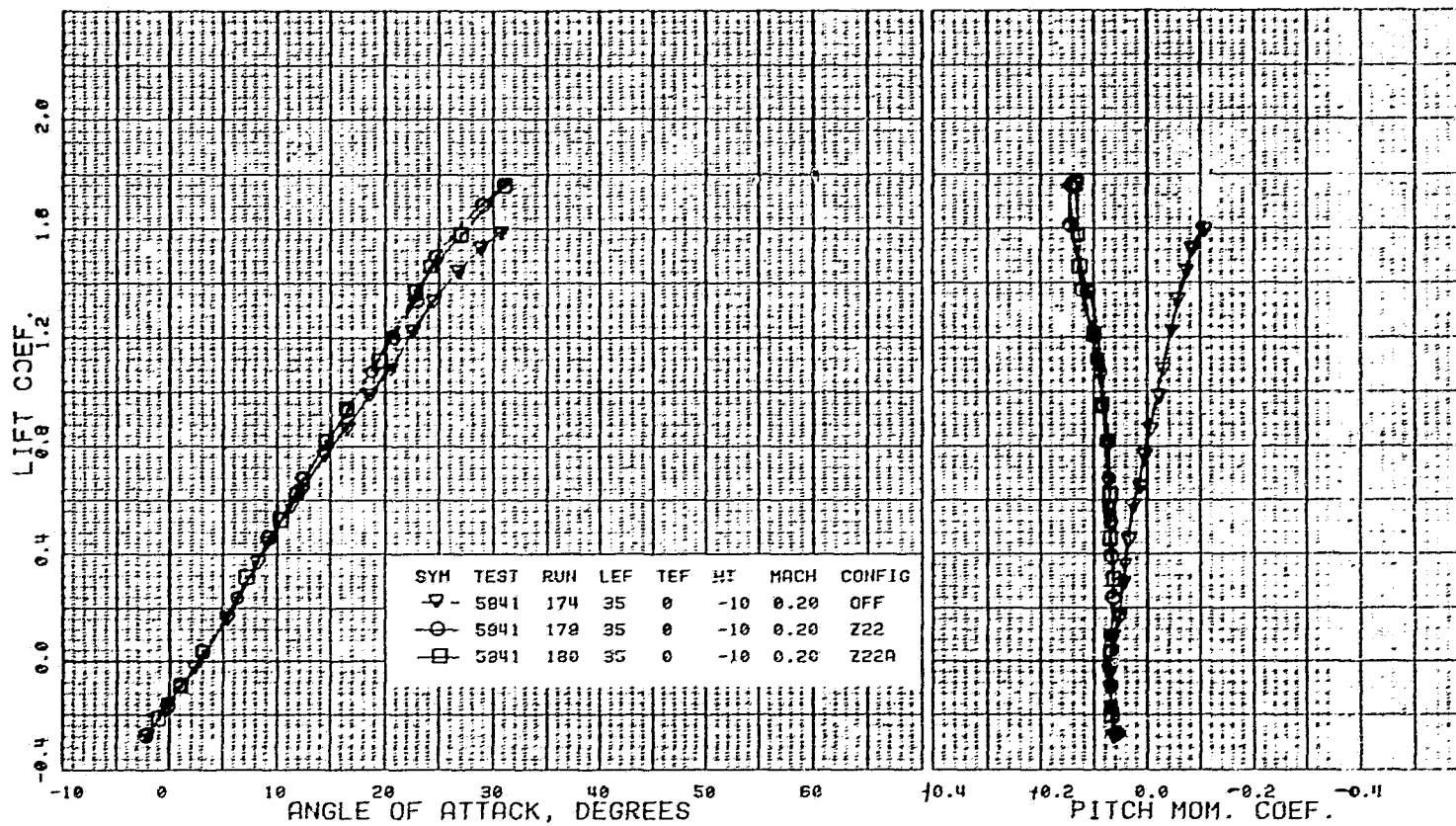


Figure 1-2 Effect of Slotted Strake 222A, Configuration 401F-5, HT=-10
(a) Lift and Pitching Moment

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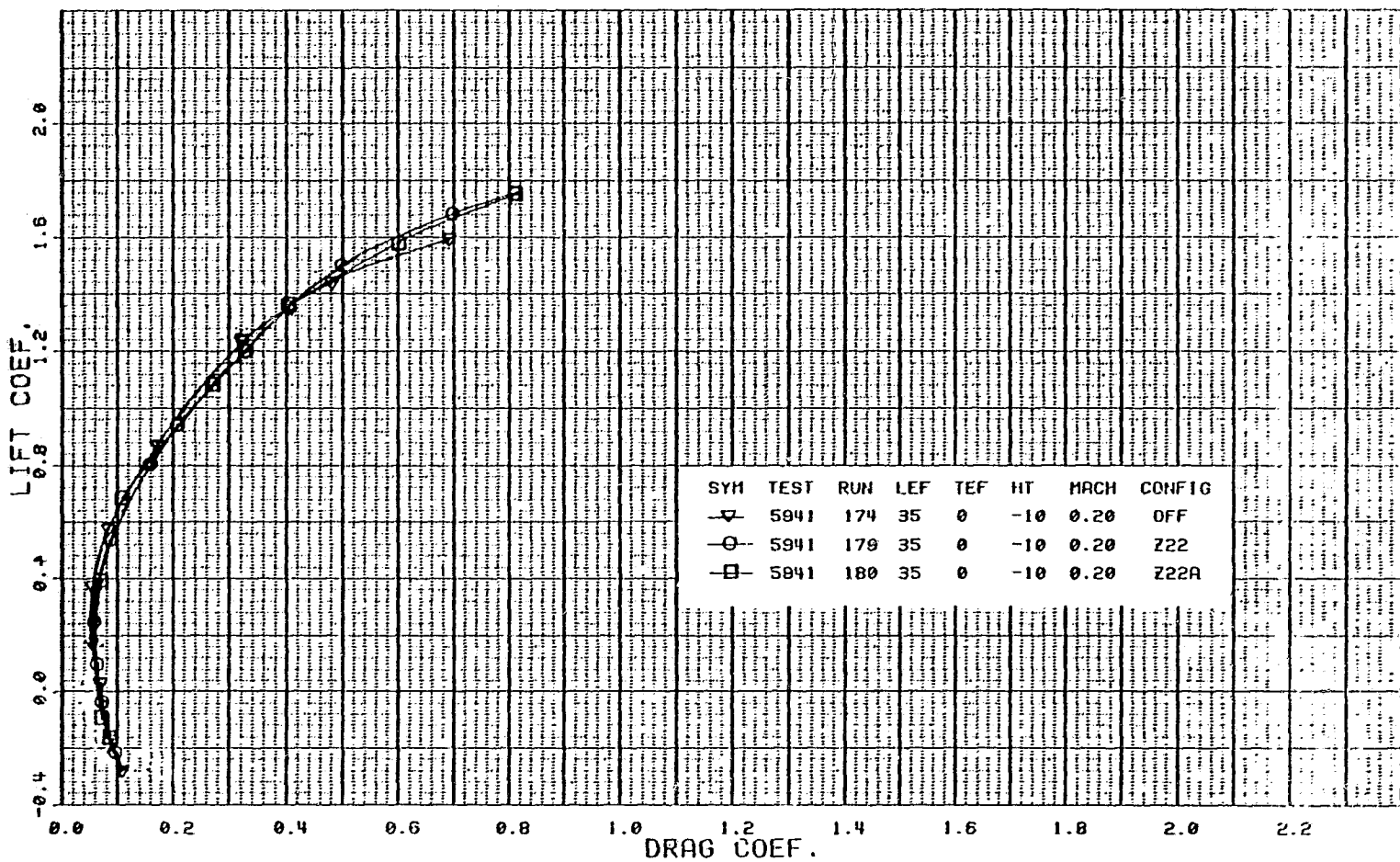


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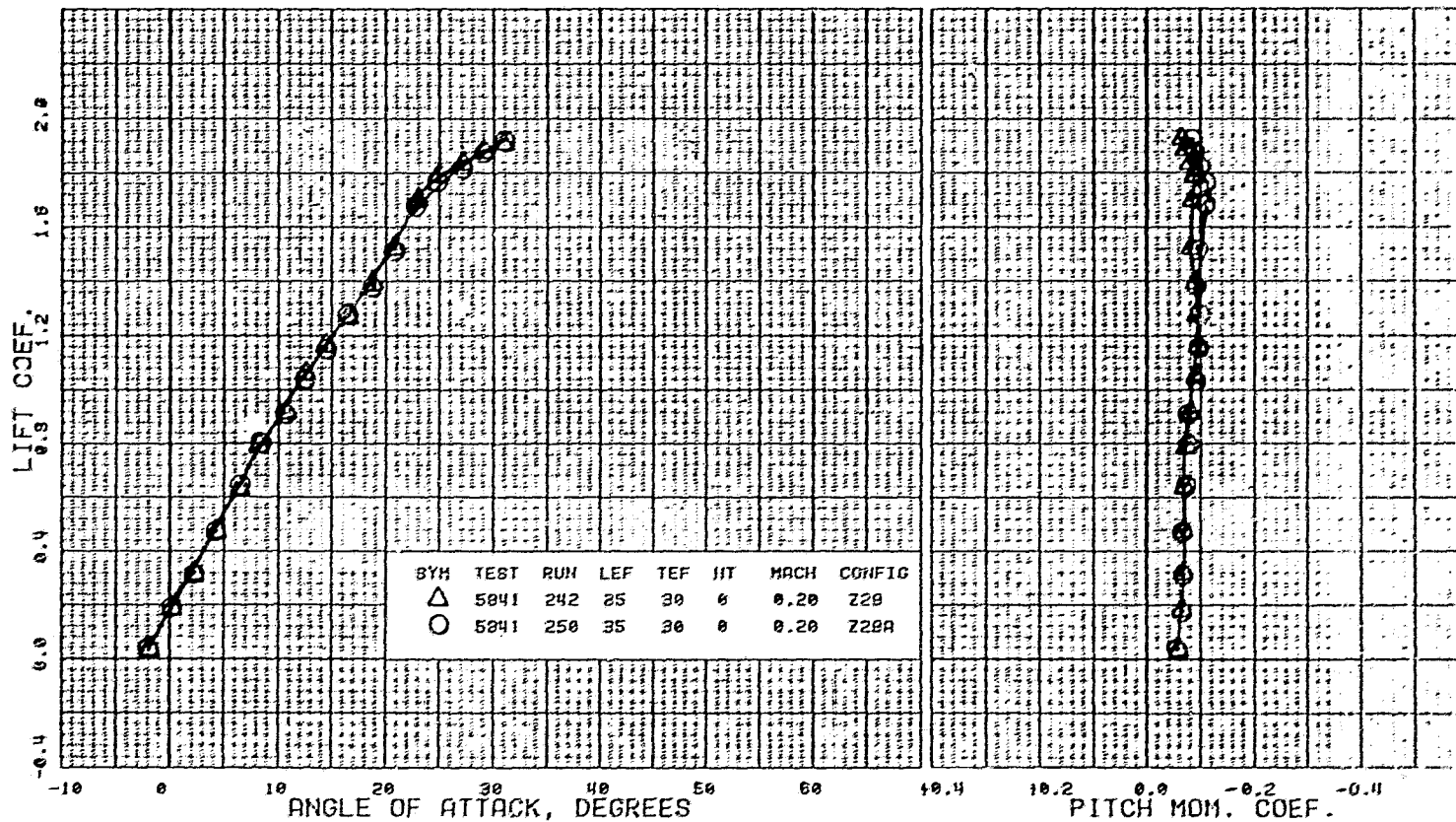


Figure 1-3 Effect of Slotted Strake Z29A, Configuration 401F-16
(a) Lift and Pitching Moment

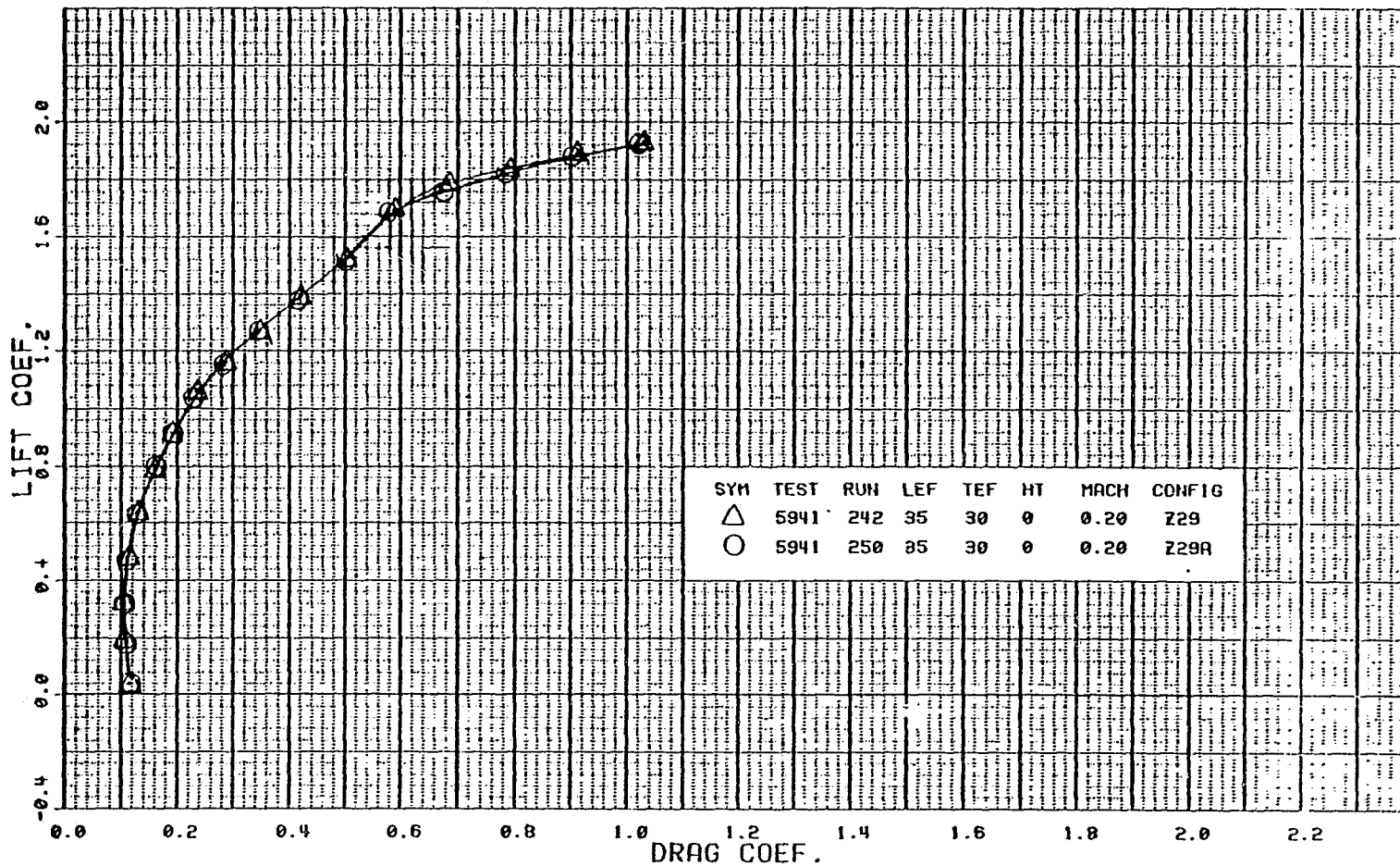


Figure 1-3 (b) Drag

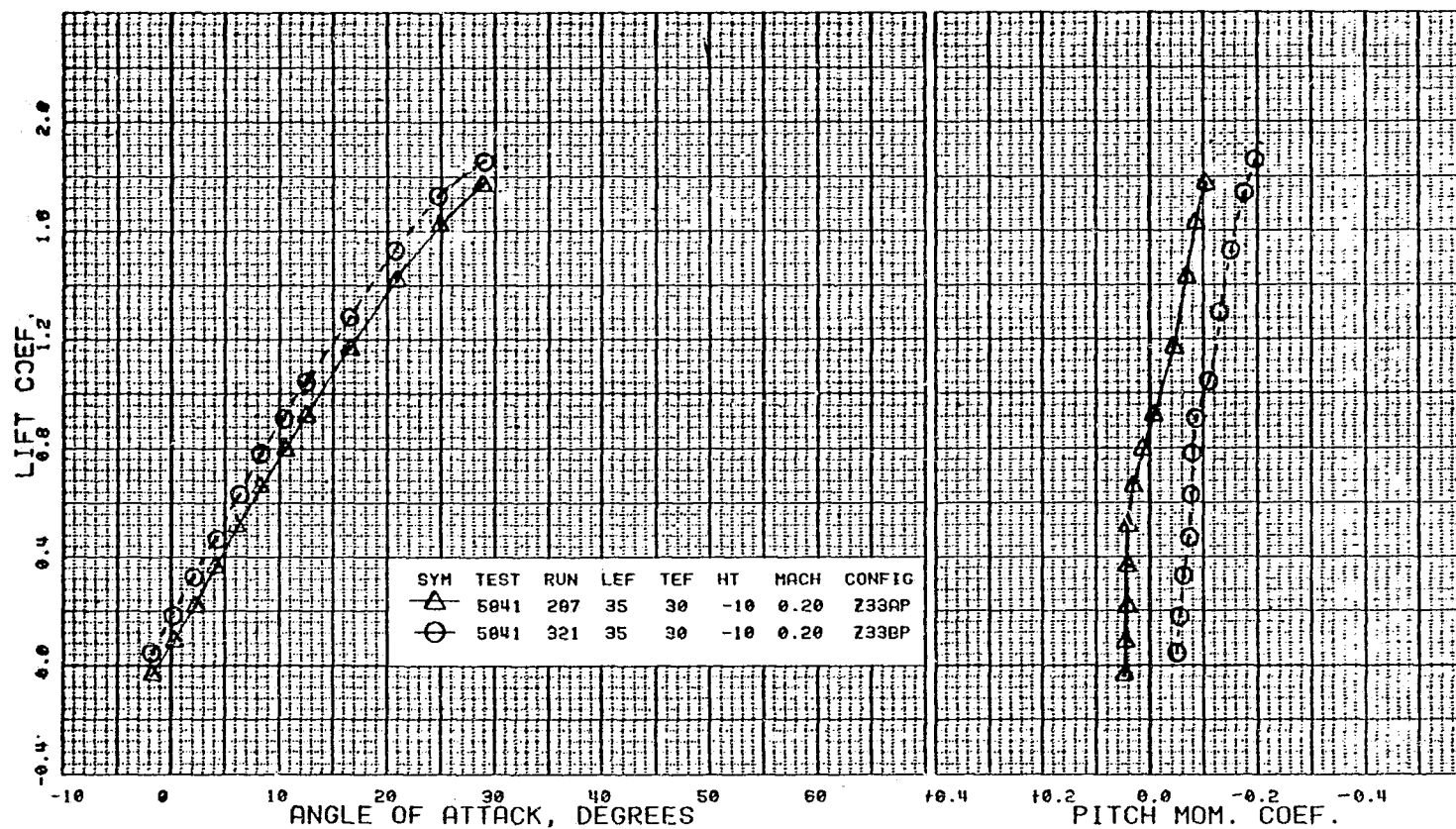


Figure 1-4 Effect of Rotating Strakes Z33A' and Z33B', Configuration 401F-16
(a) Lift and Pitching Moment

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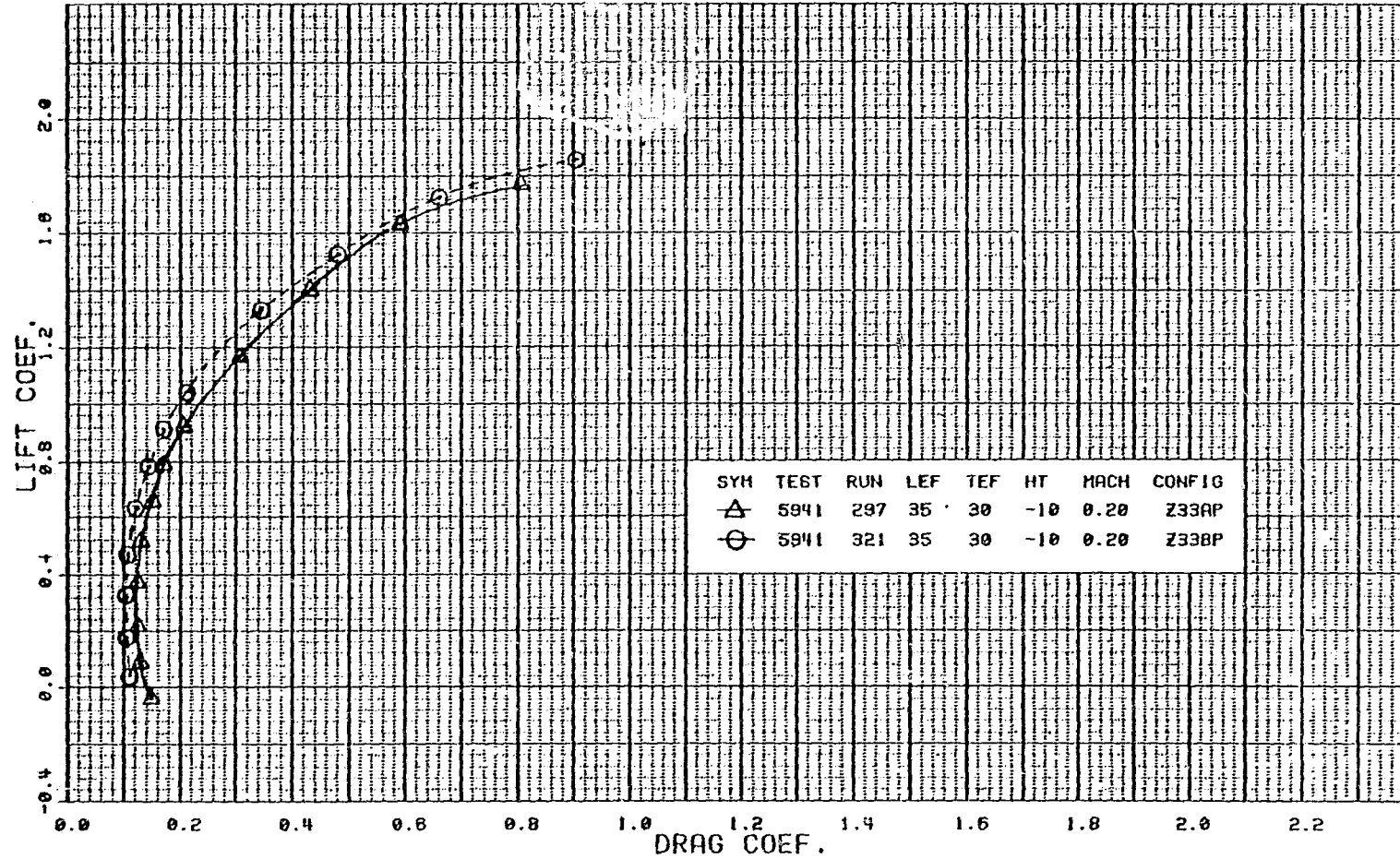


Figure 1-4 (b) Drag

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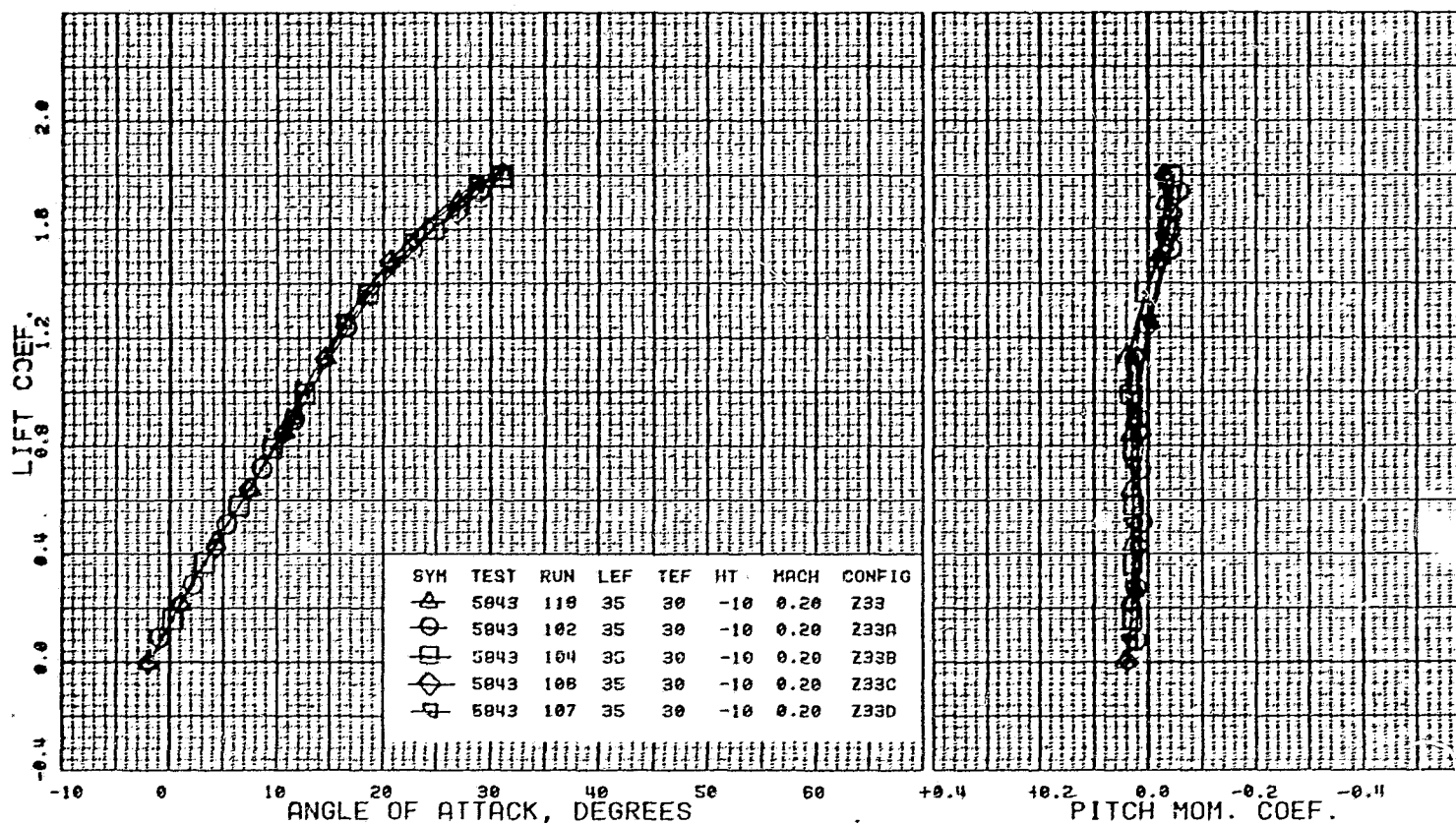


Figure 1-5 Effect of Rotating Strakes Z33A-Z33D, Configuration 401F-16
(a) Lift and Pitching Moment

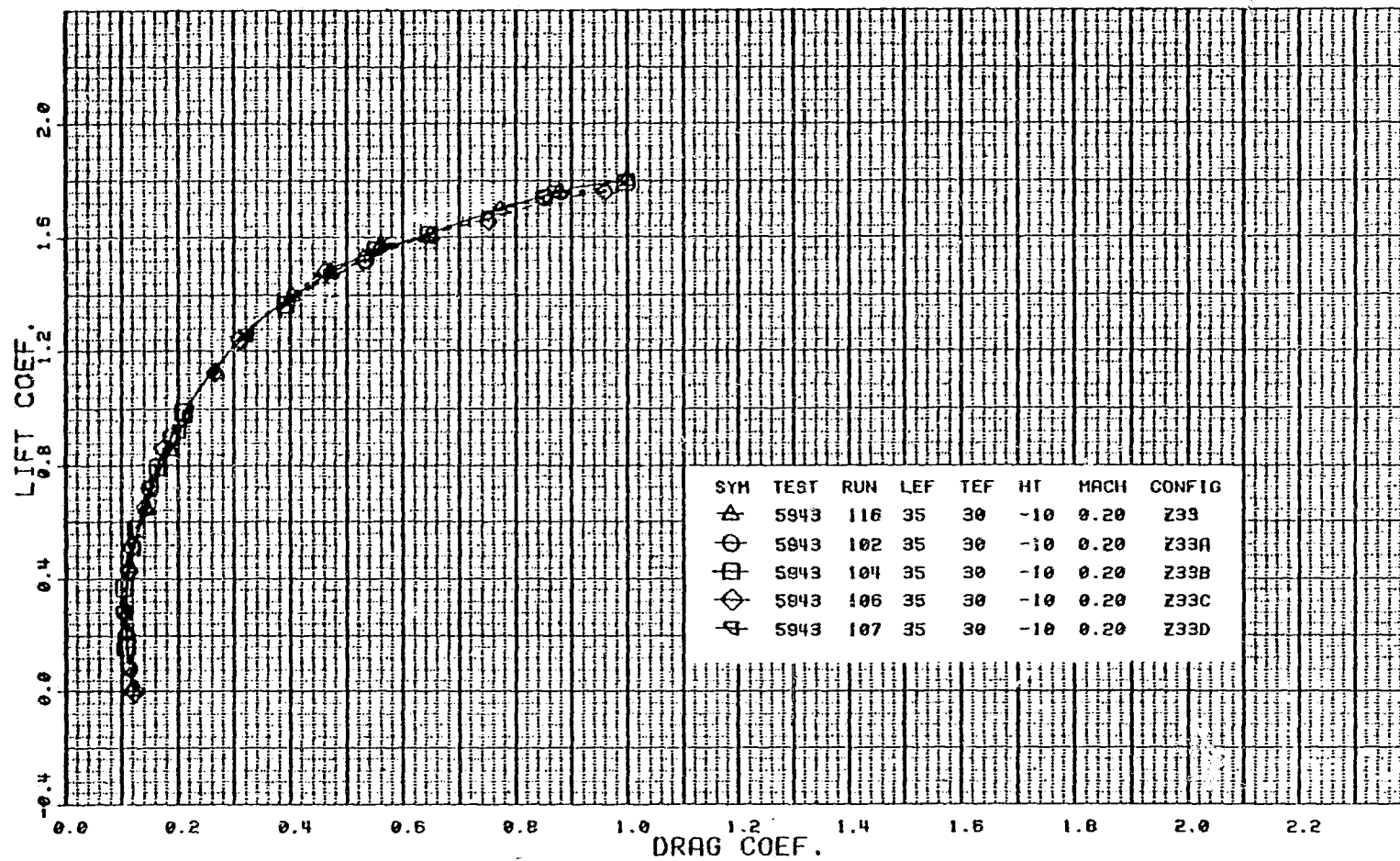


Figure 1-5 (b) Drag

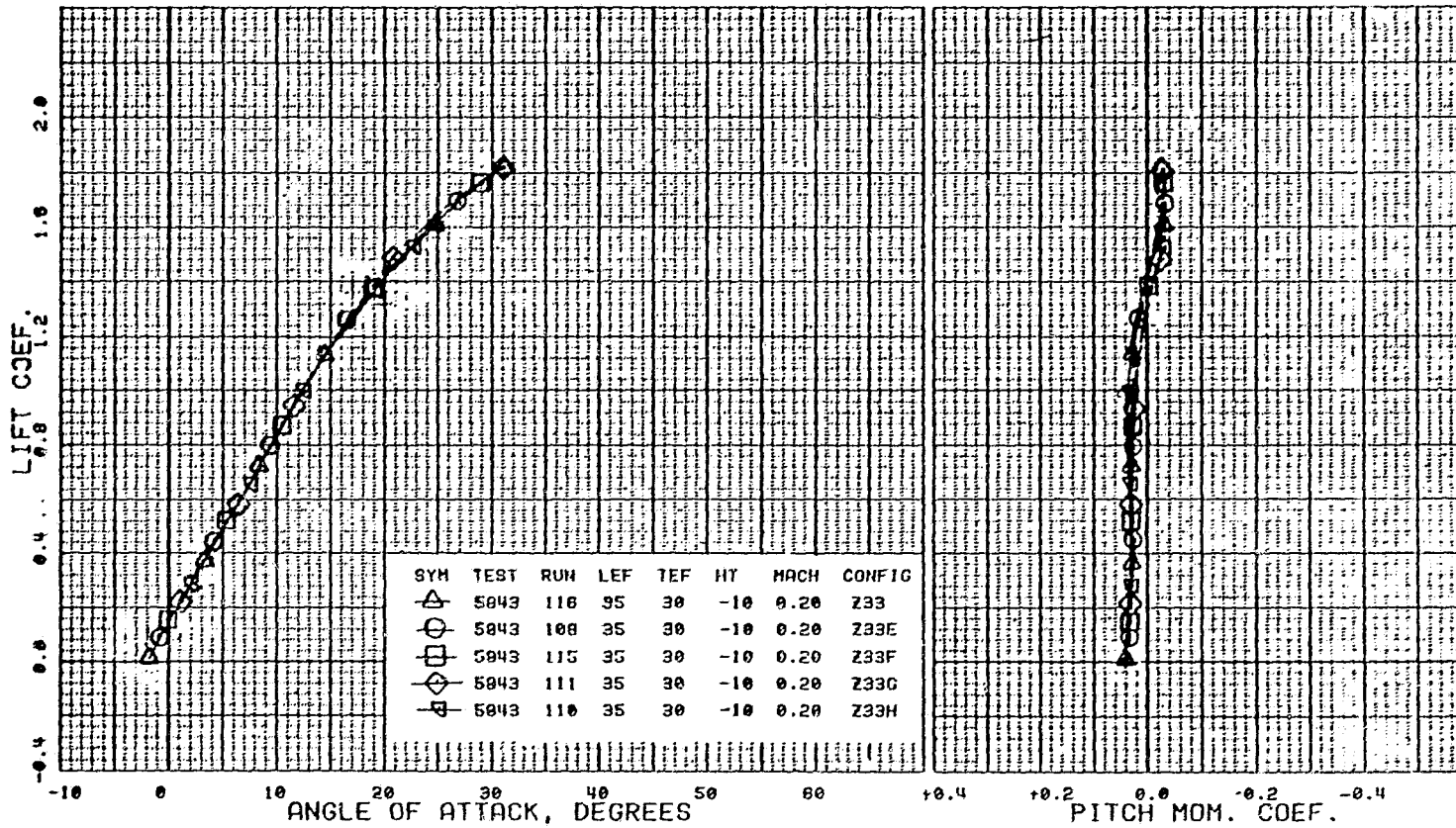


Figure 1-6 Effect of Rotating Strakes Z33E-Z33H, Configuration 401F-16
(a) Lift and Pitching Moment

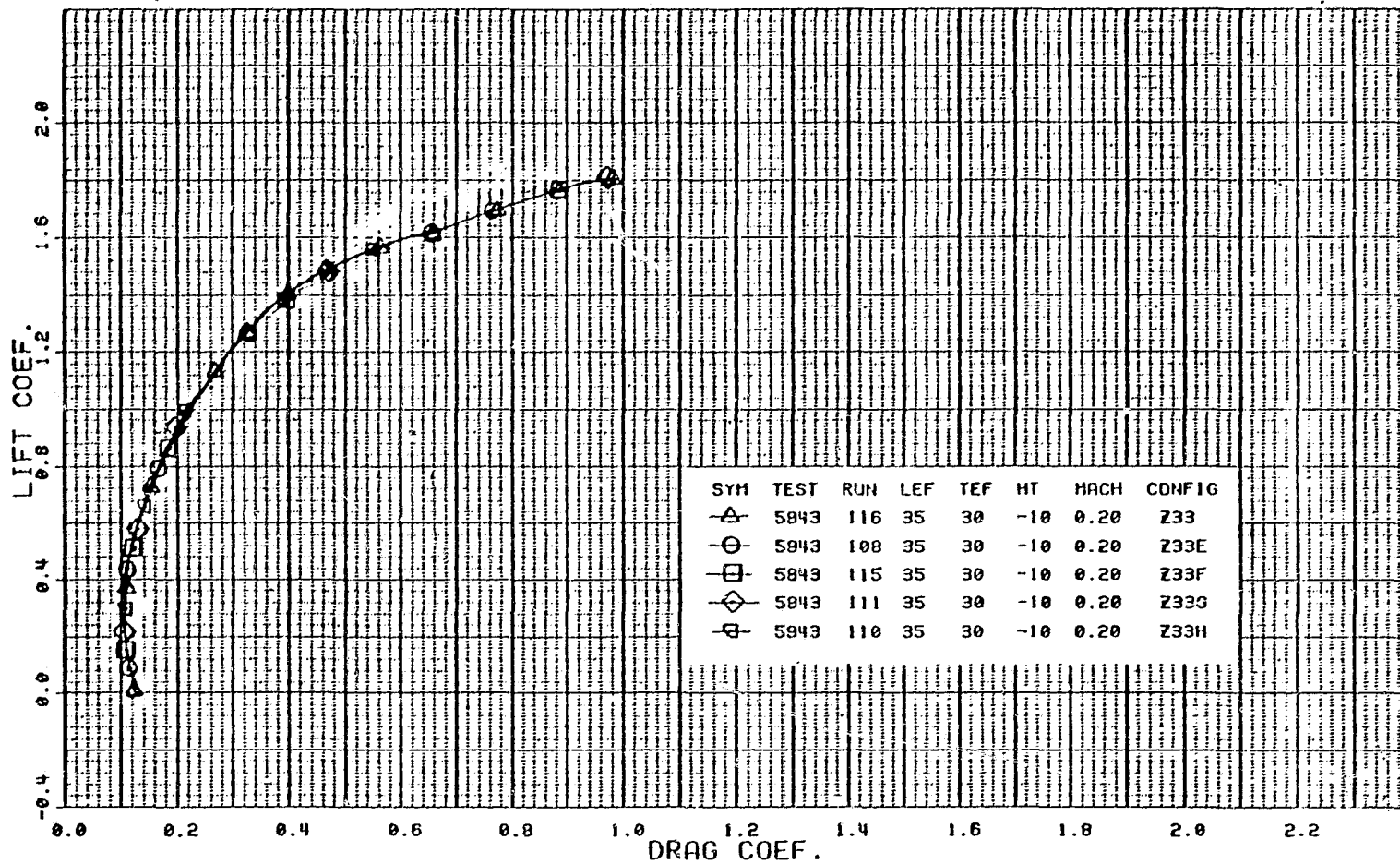


Figure 1-6 (b) Drag

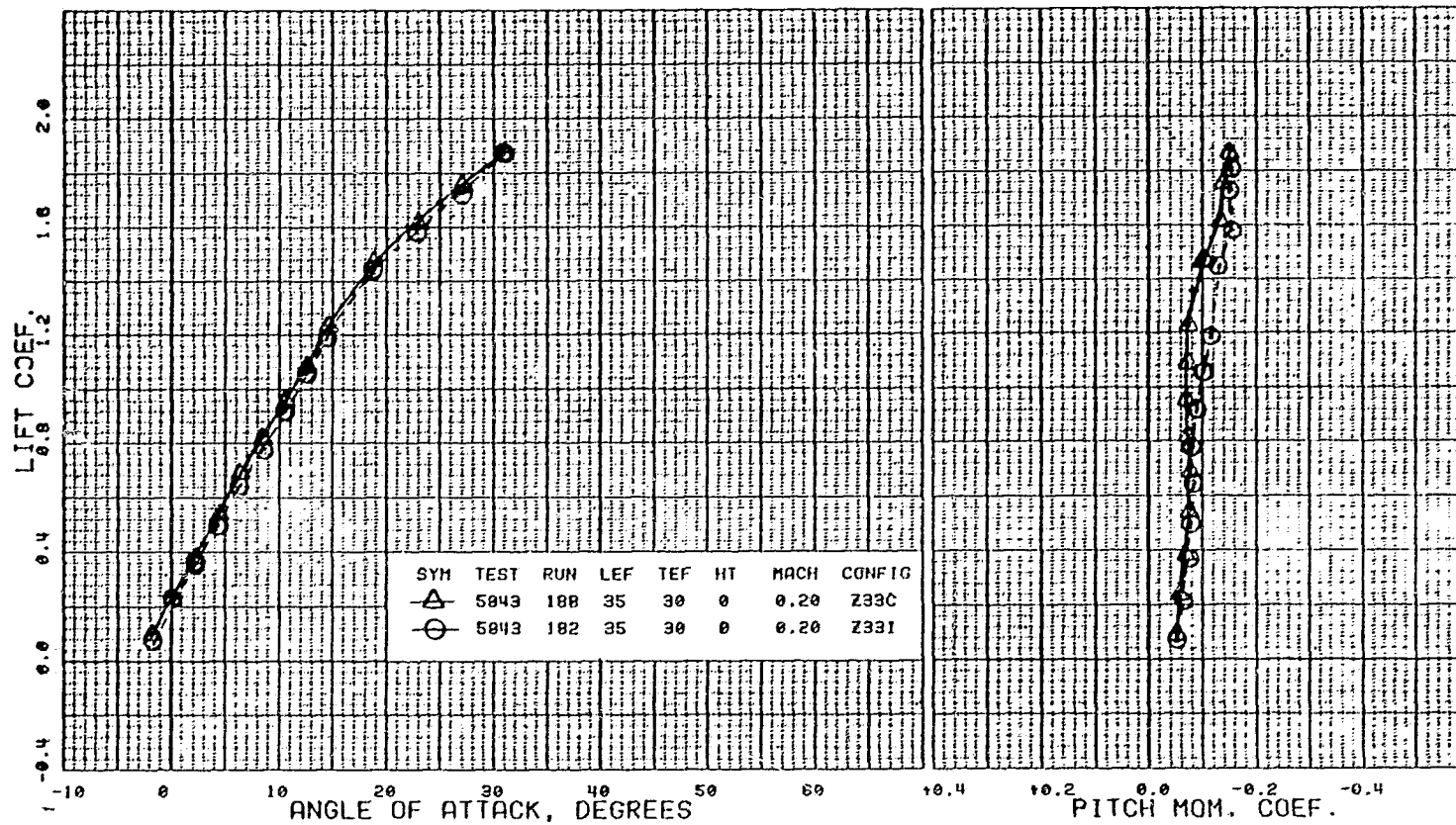


Figure 1-7 Effect of Rotating Strakes Z33C and Z33I, Configuration 401F-16
(a) Lift and Pitching Moment

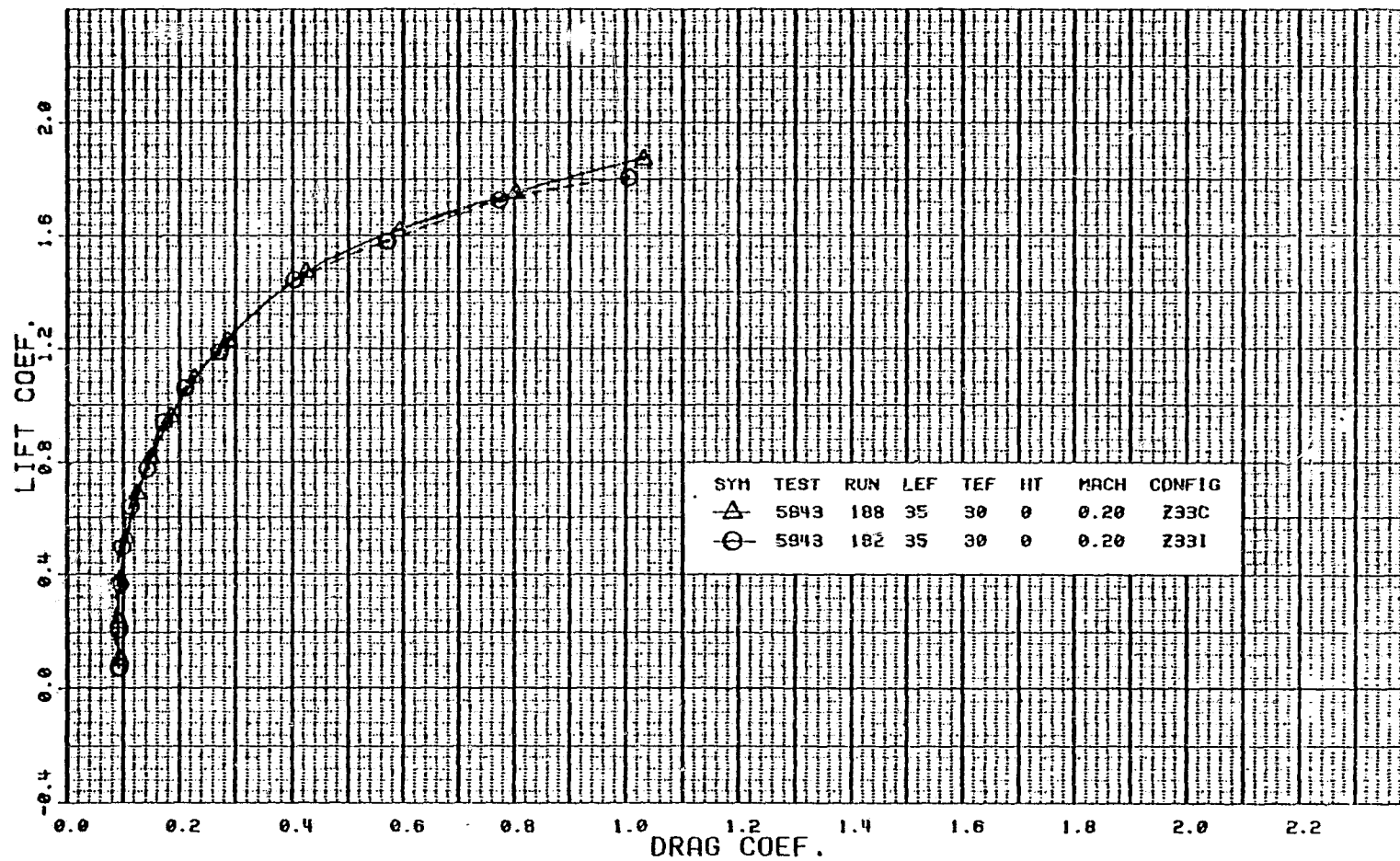


Figure 1-7 (b) Drag

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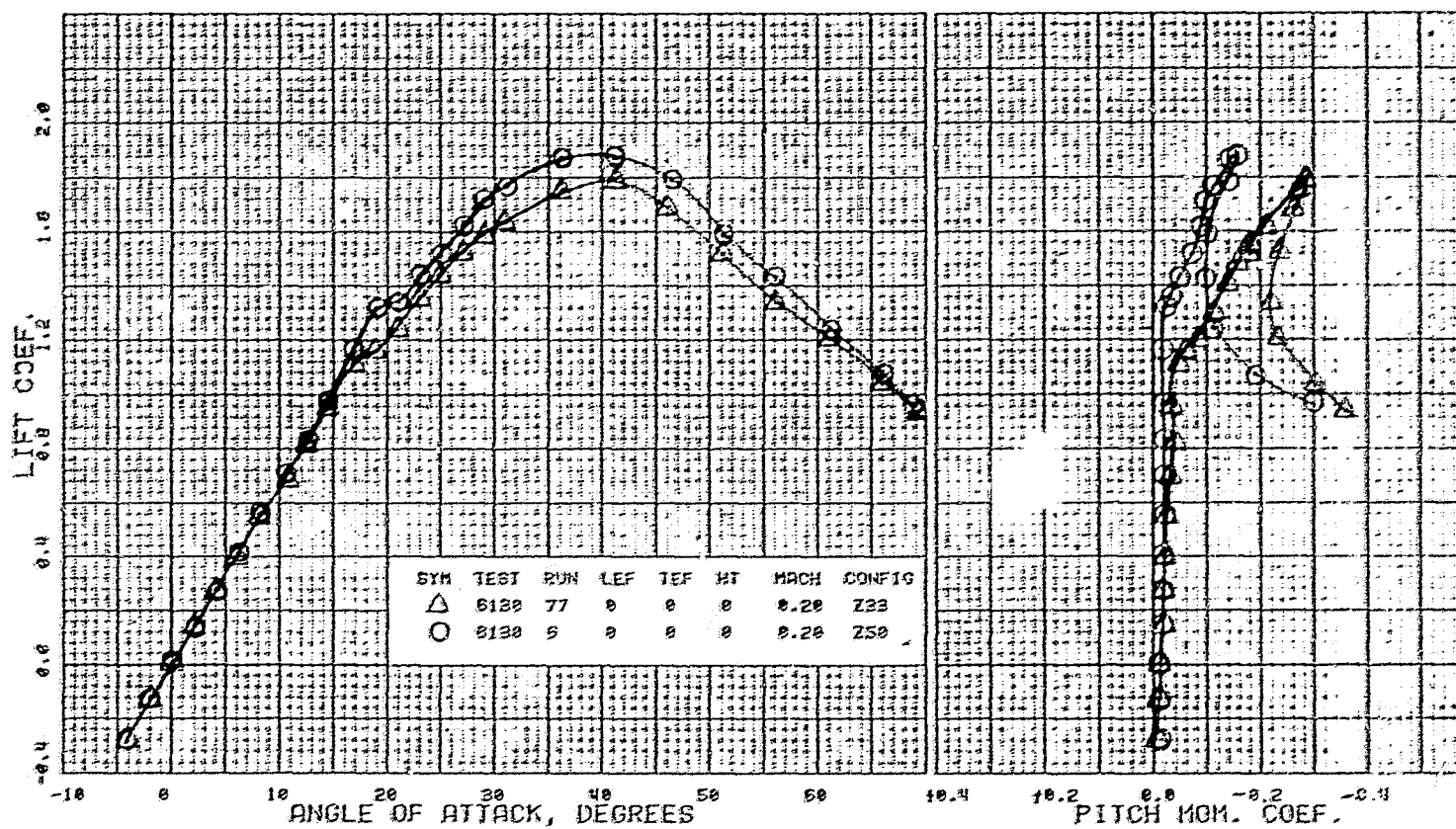


Figure 1-8 Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16, IEF=0
(a) Lift and Pitching Moment

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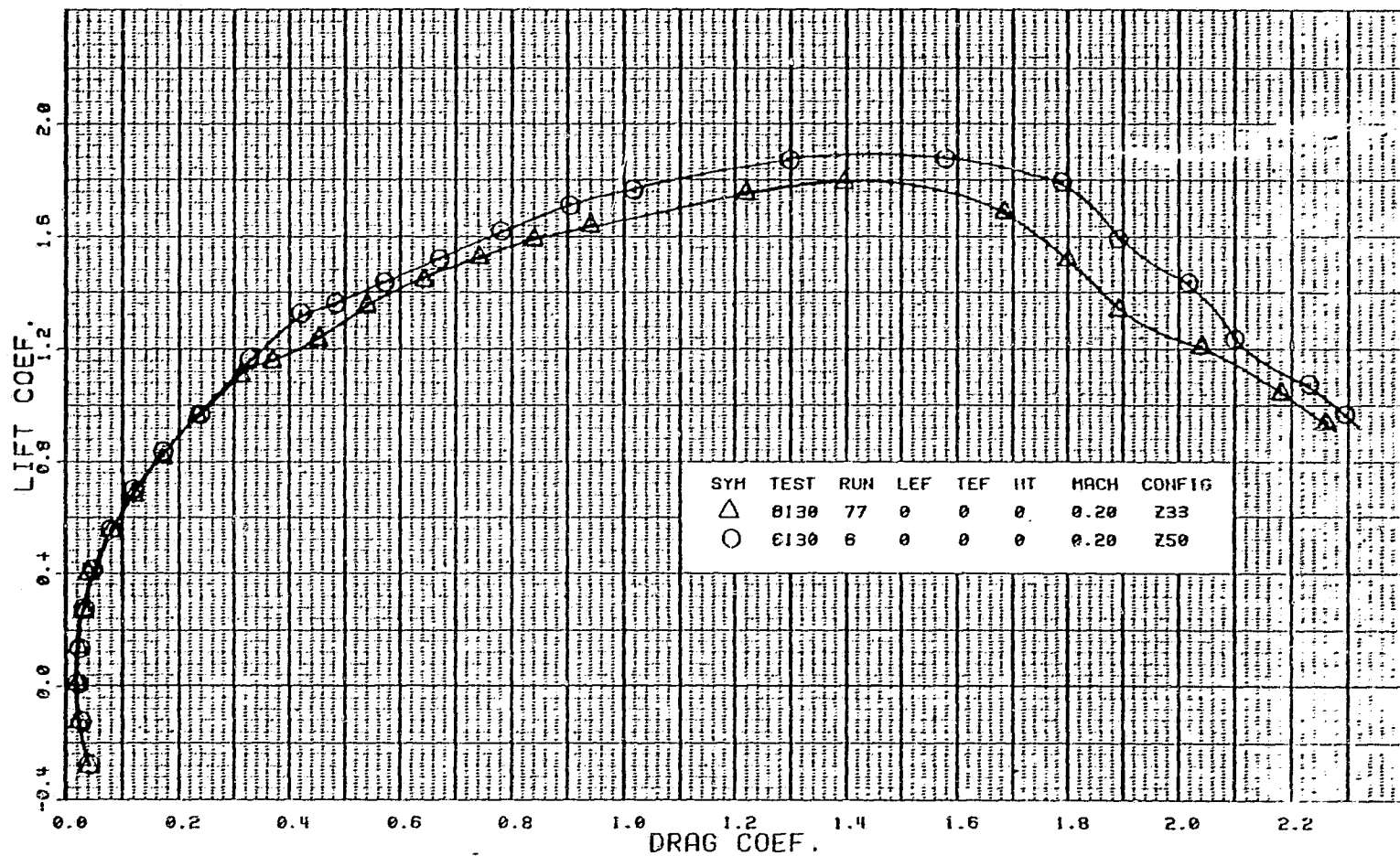


Figure 1-8 (b) Drag

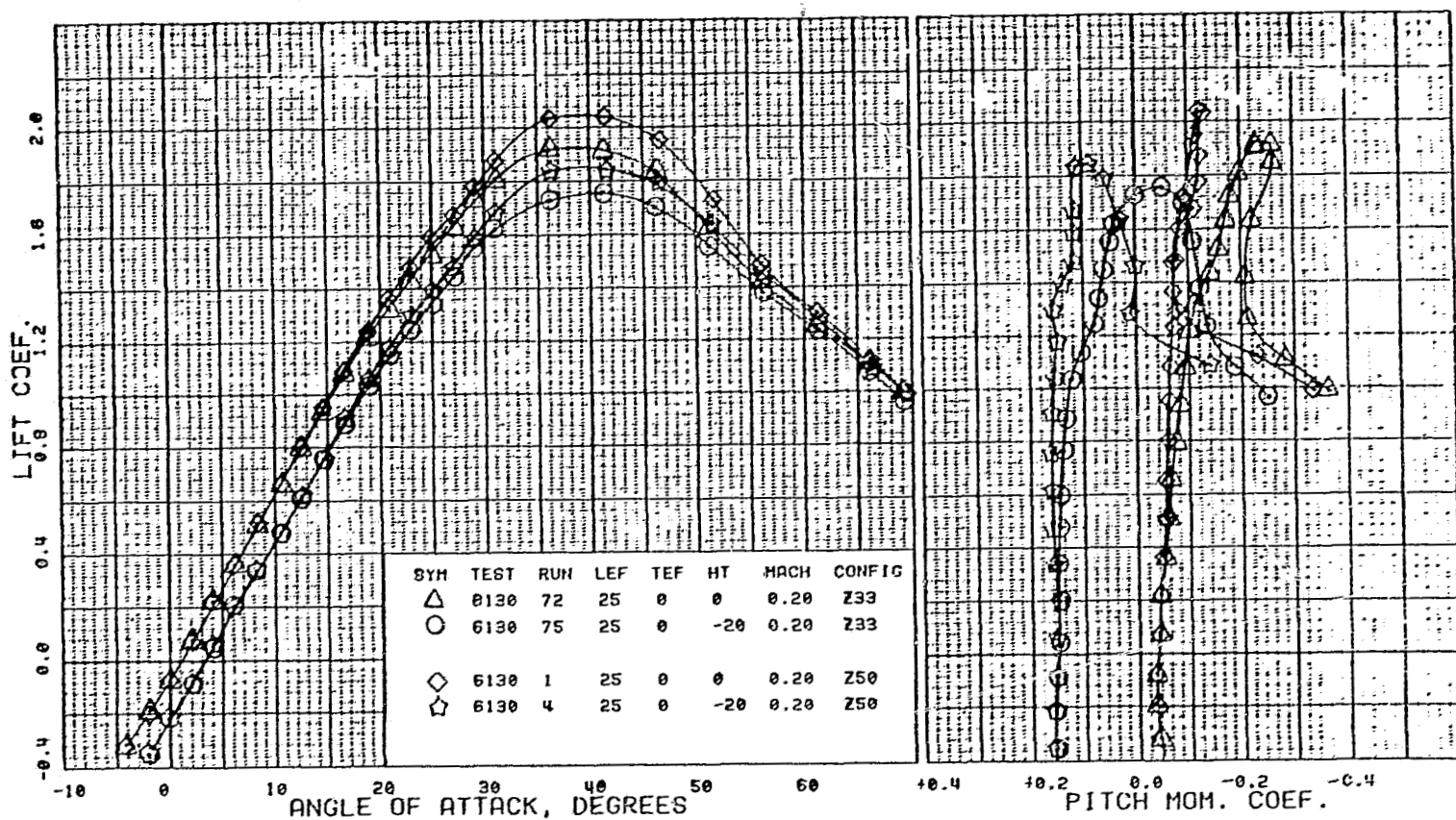


Figure 1-9 Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16, LEF=25°
(a) Lift and Pitching Moment

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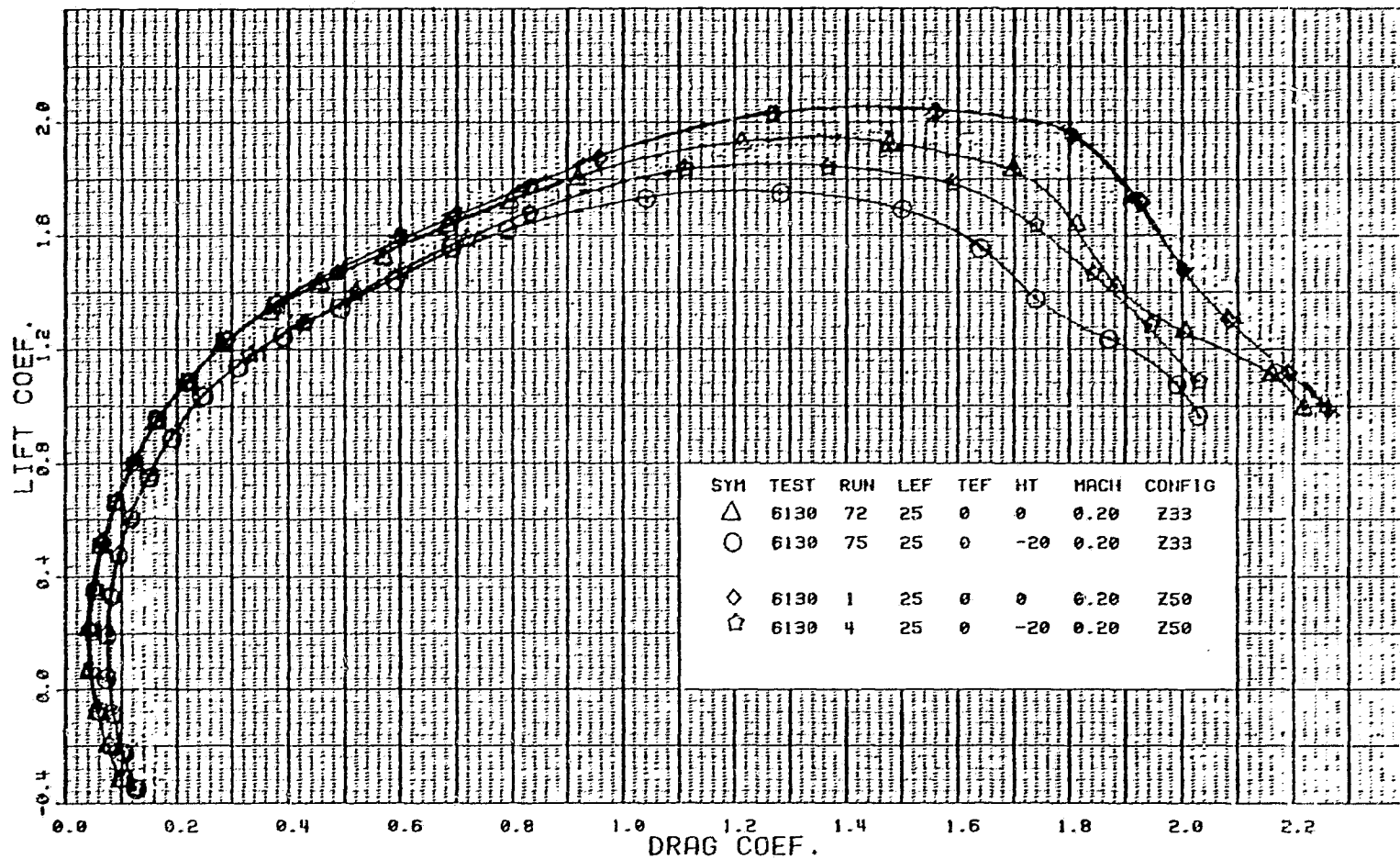


Figure 1-9 (b) Drag

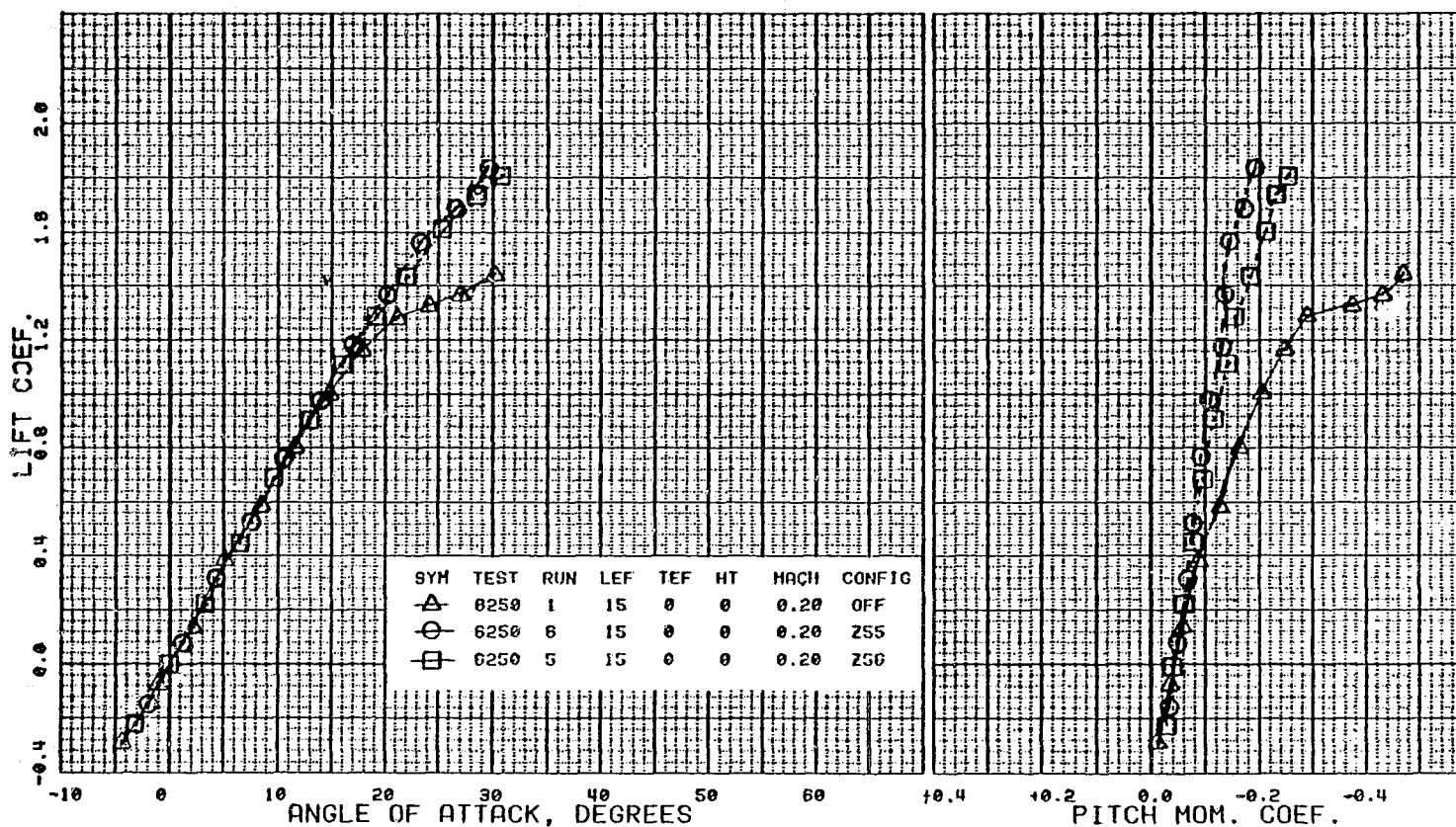


Figure 1-10 Effect of Forebody Strakes Z55 and Z56, YF-16
(a) Lift and Pitching Moment

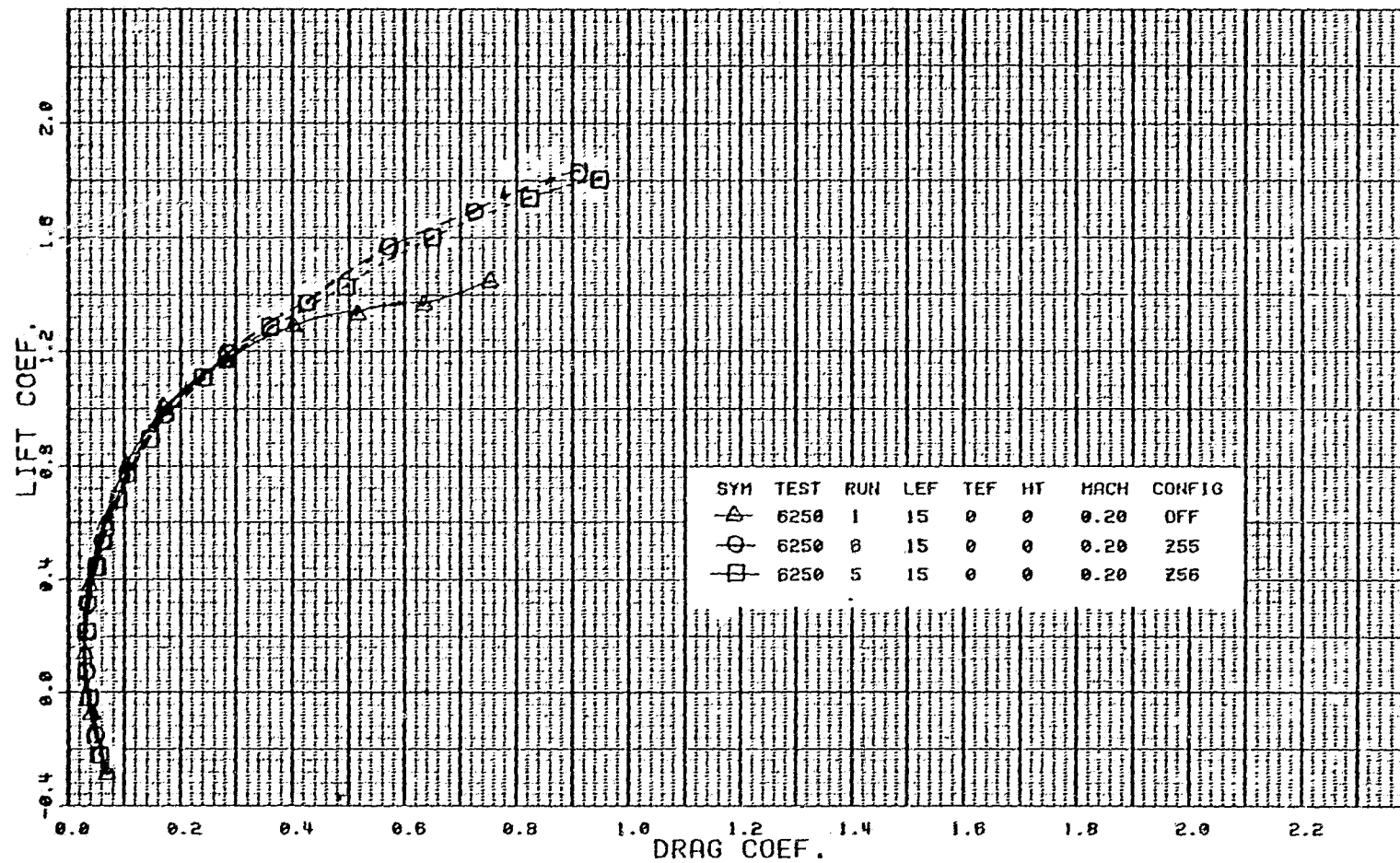


Figure 1-10 (b) Drag

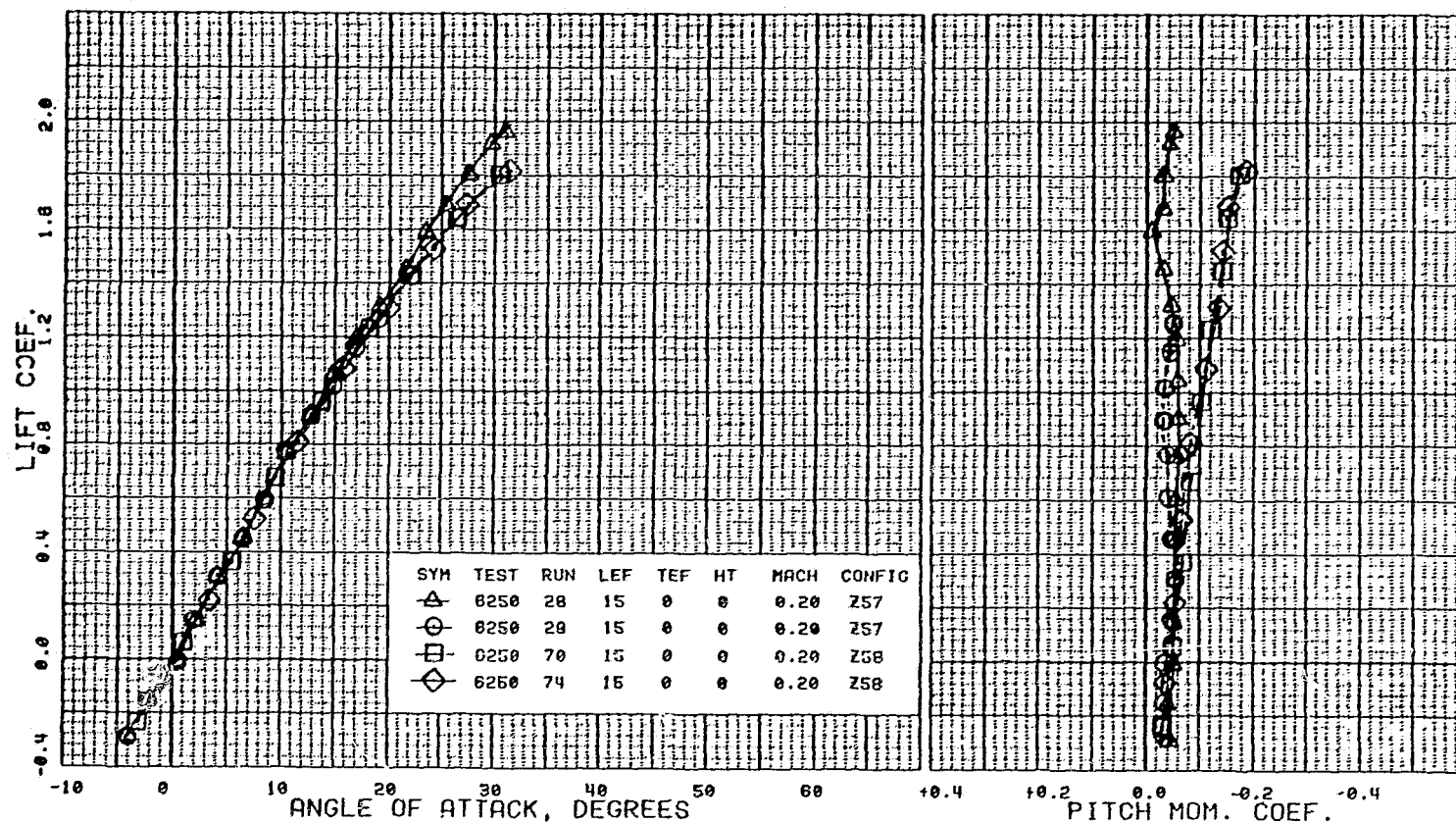
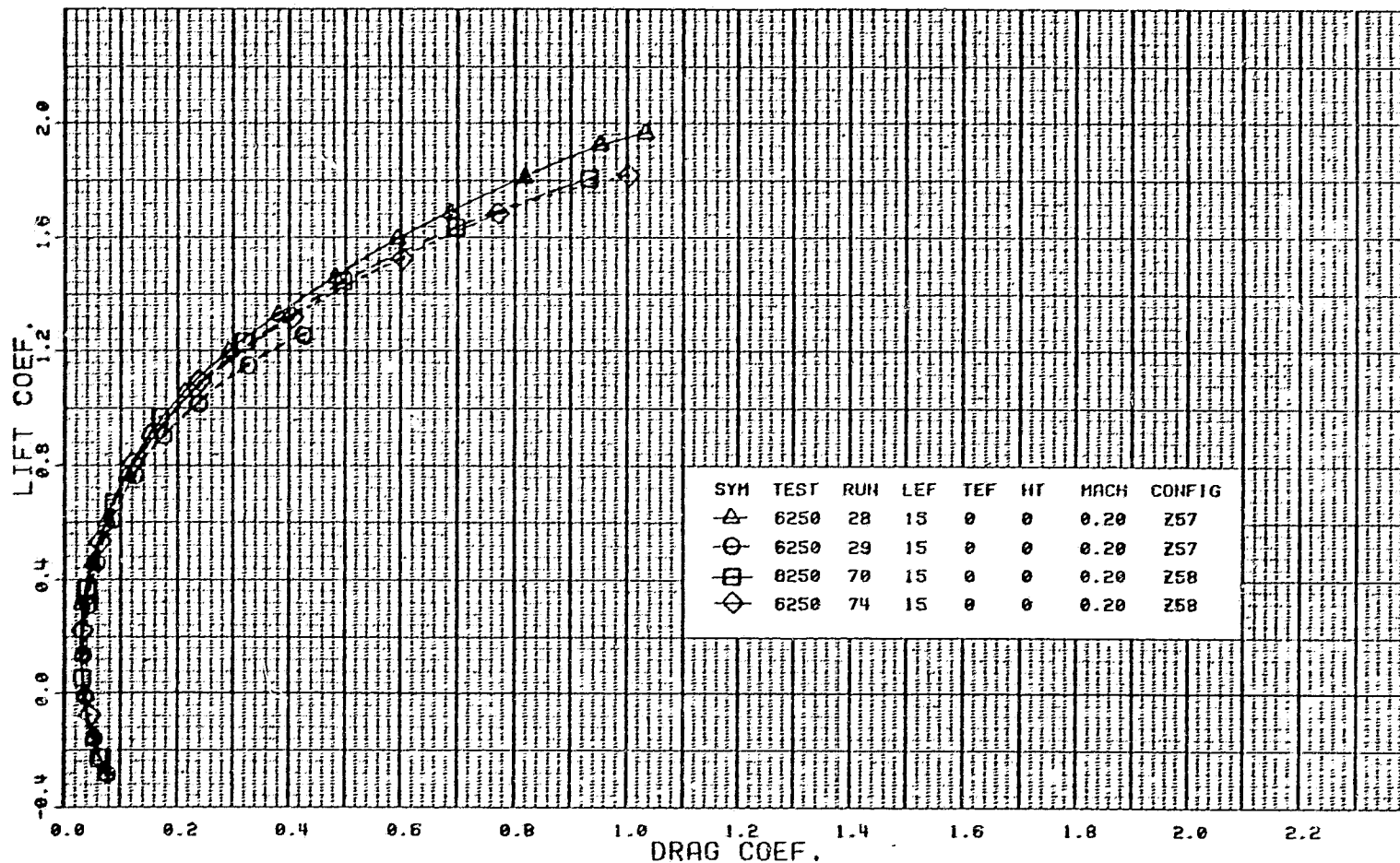


Figure 1-11 Effect of Large Rotating Strakes Z57 and Z58, YF-16
(a) Lift and Pitching Moment

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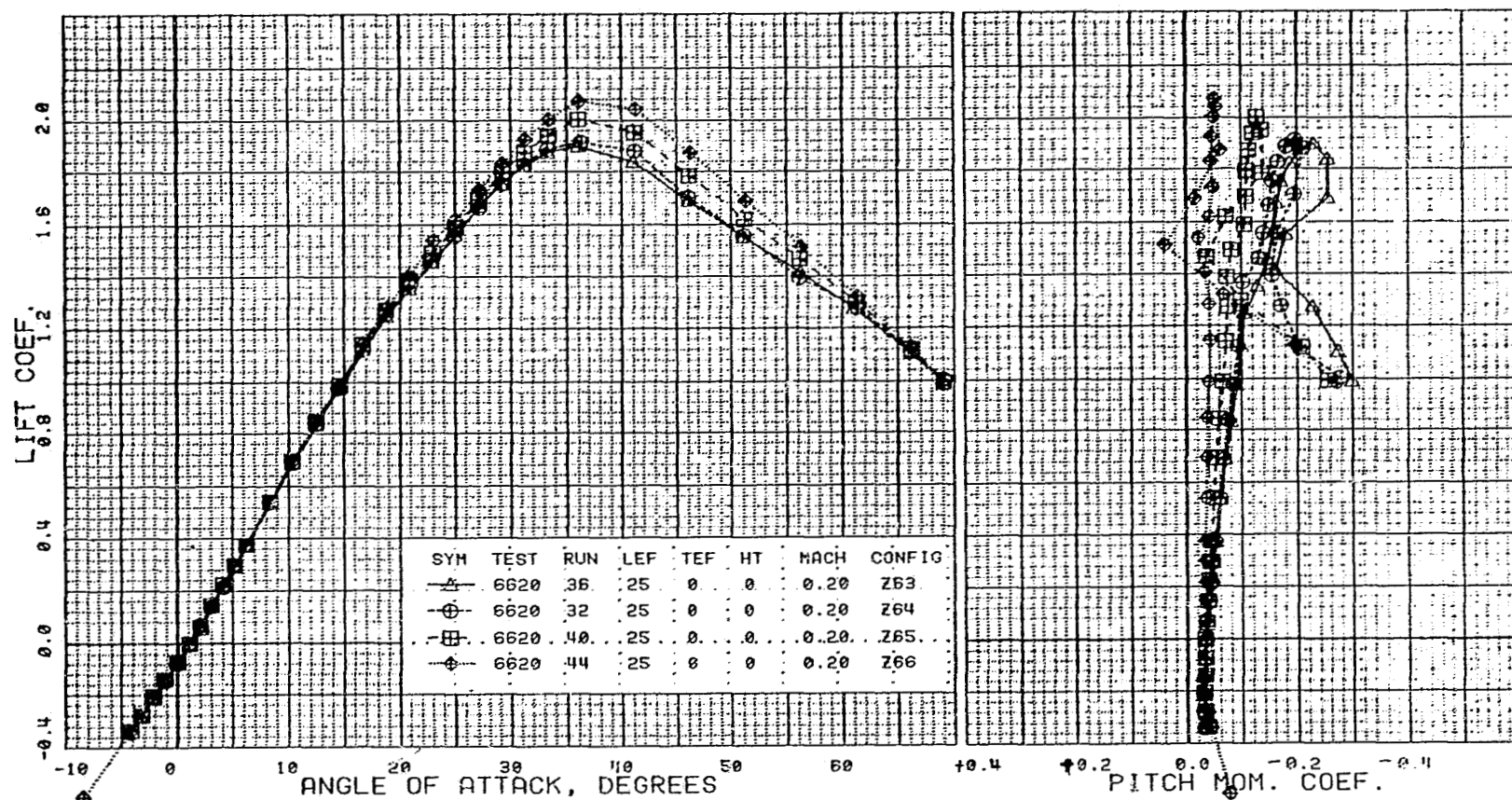


Figure 1-12 Effect of Forebody Strakes Z63-Z66, YF-16 + 30.5 Stretch
(A) Lift and Pitching Moment

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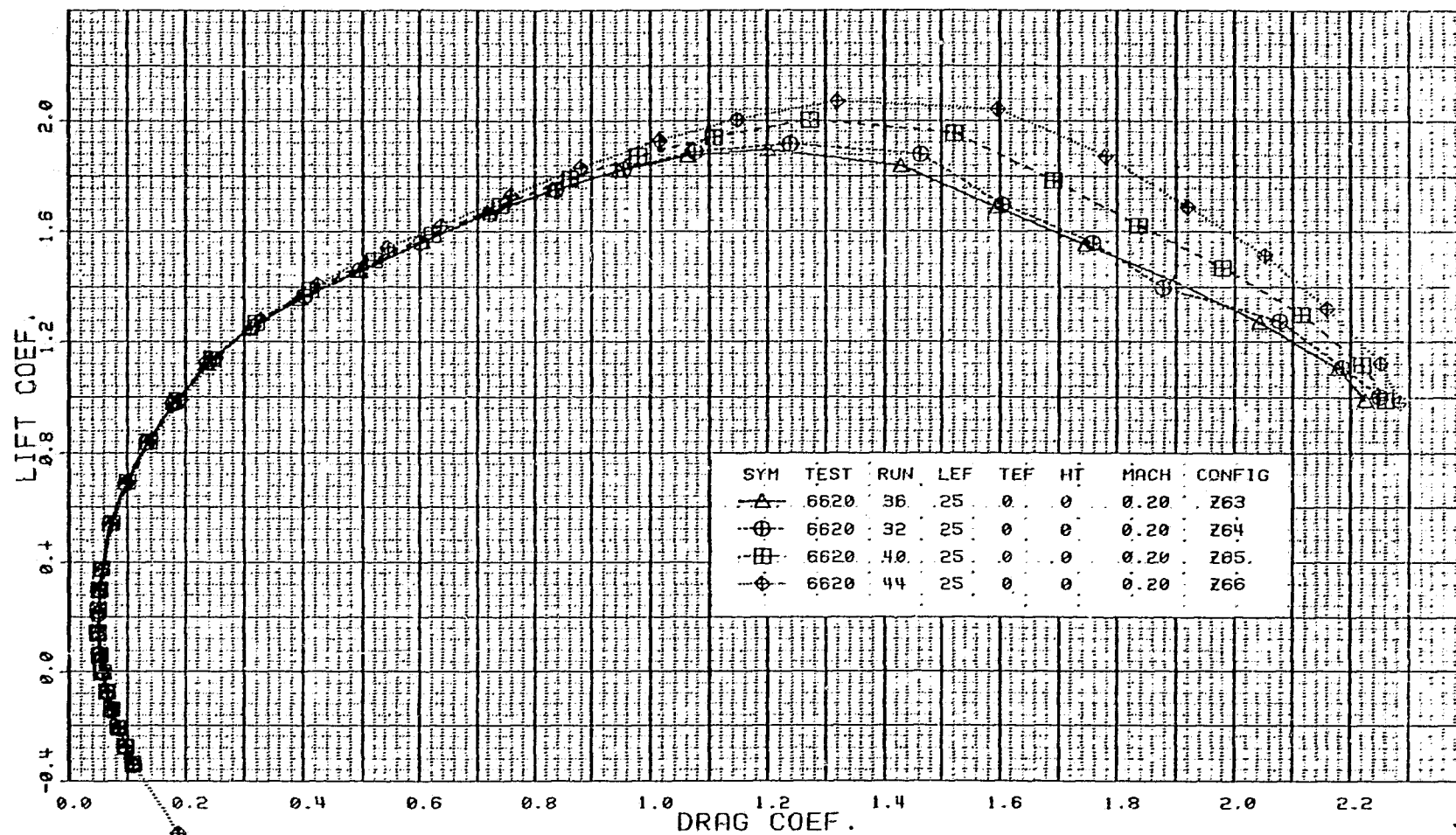


Figure 1-12 (b) Drag

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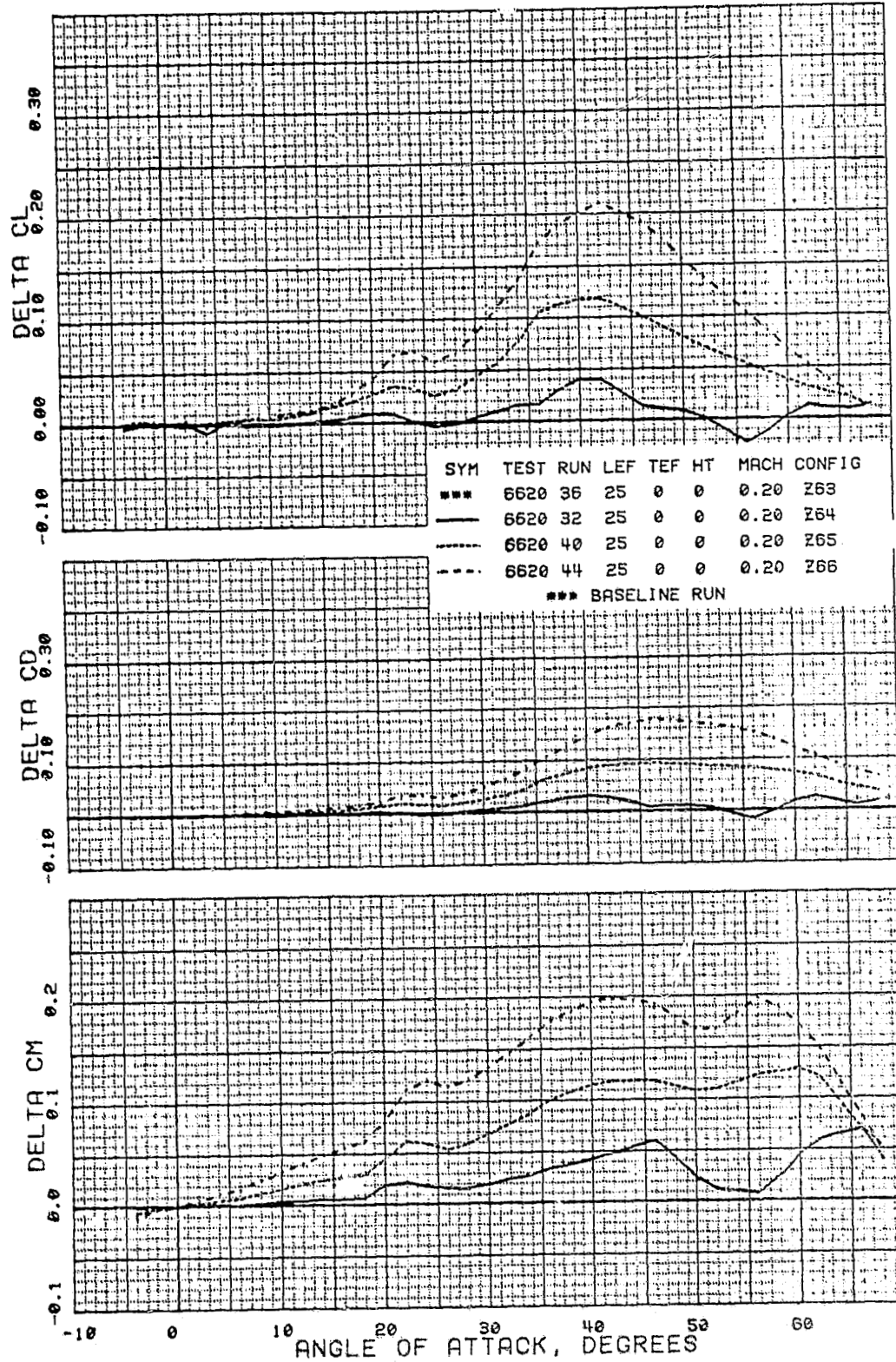


Figure 1-12 (c) Increments

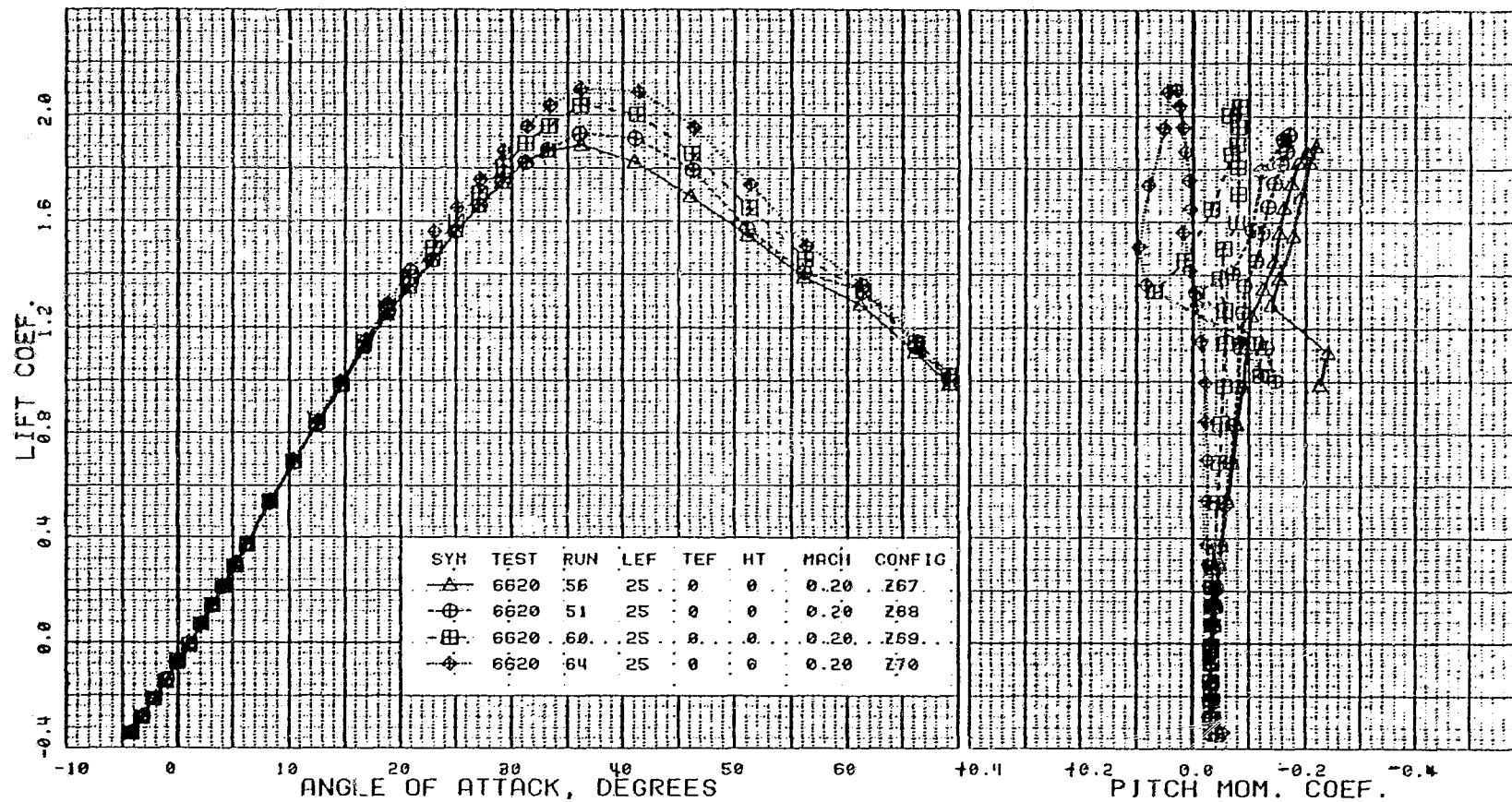


Figure 1-13 Effect of Forebody Strakes Z67-Z70, YF-16 + 44.5 Stretch
(a) Lift and Pitching Moment

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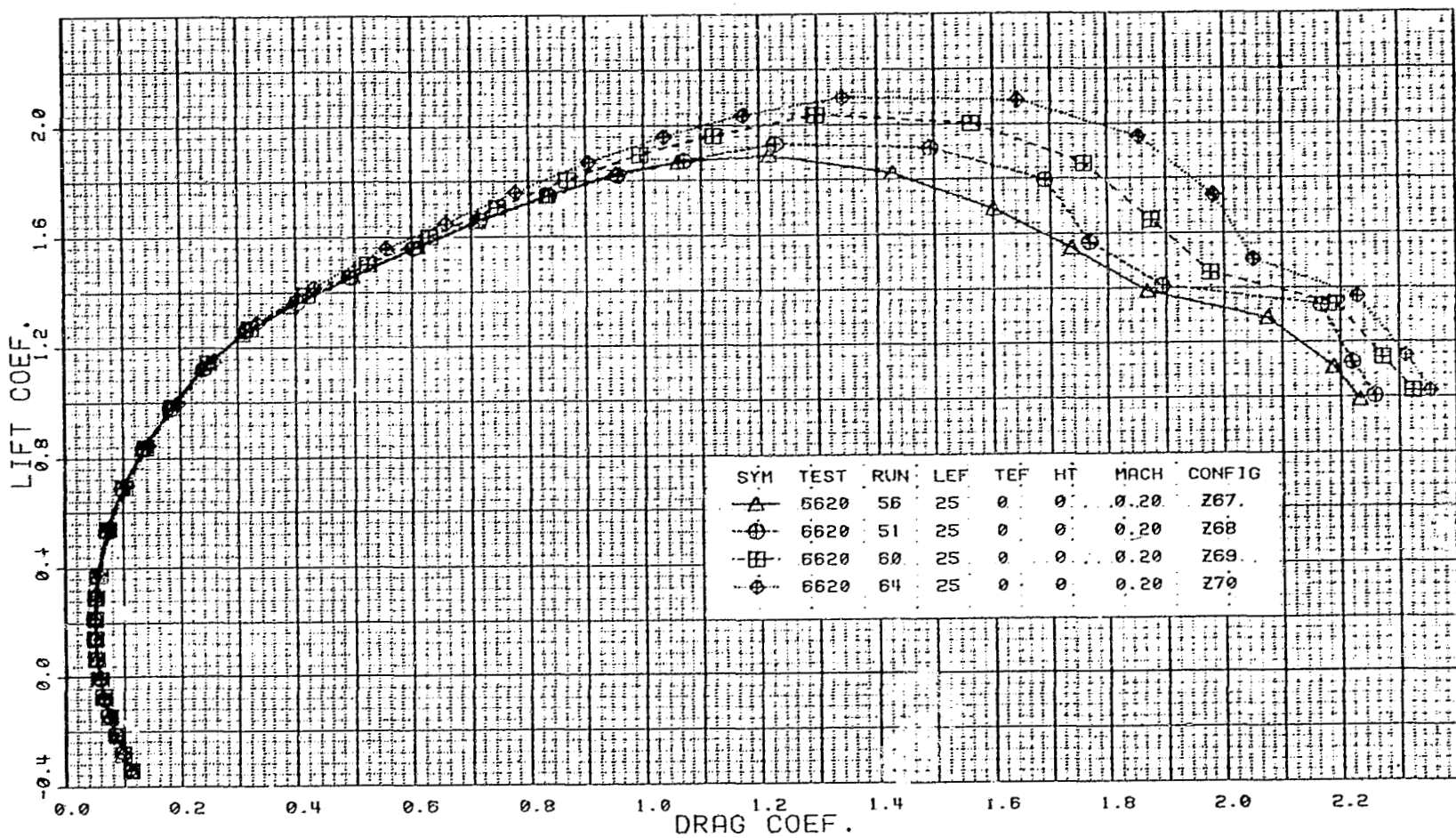


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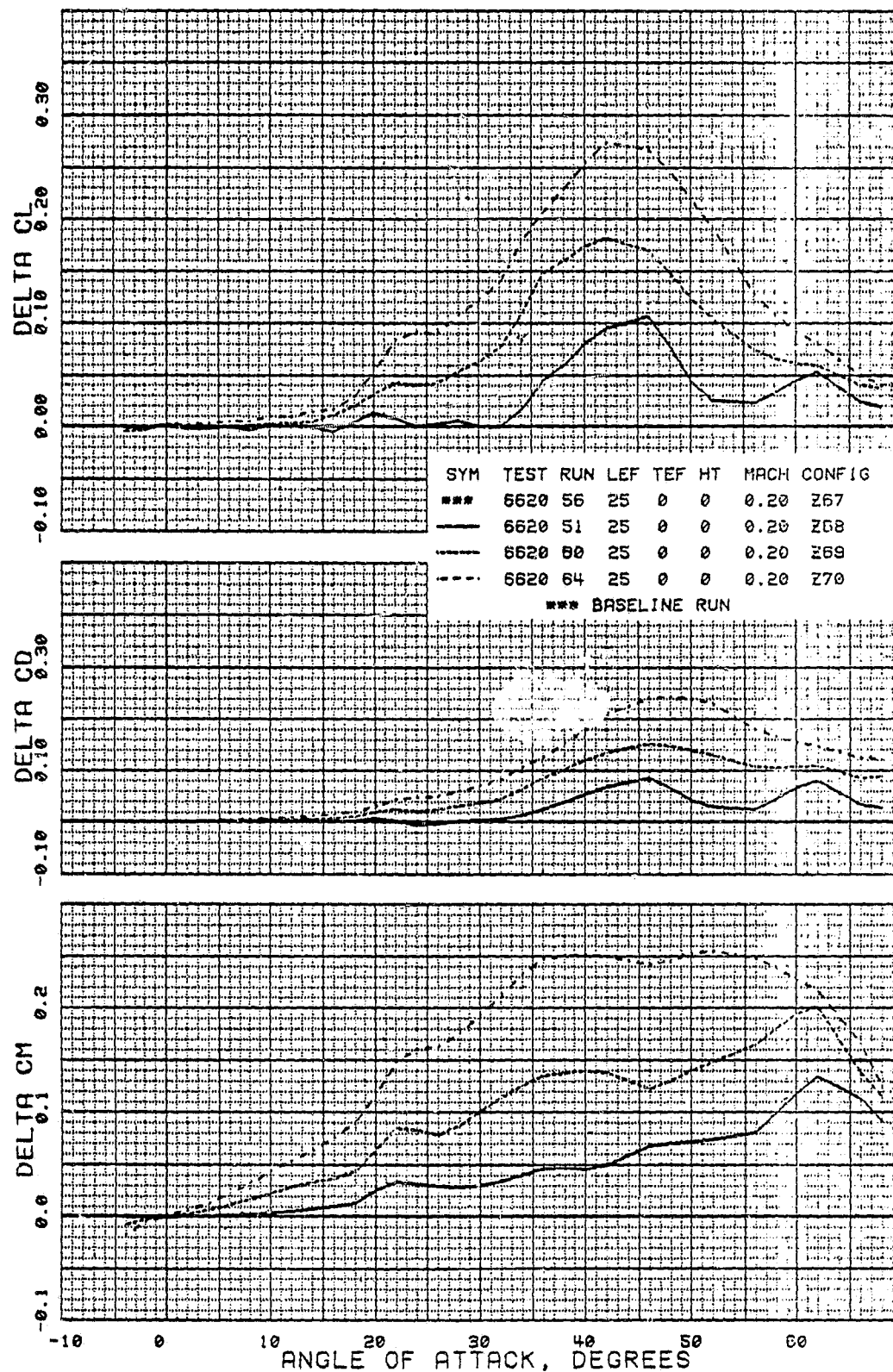


Figure 1-18 (c) Increments

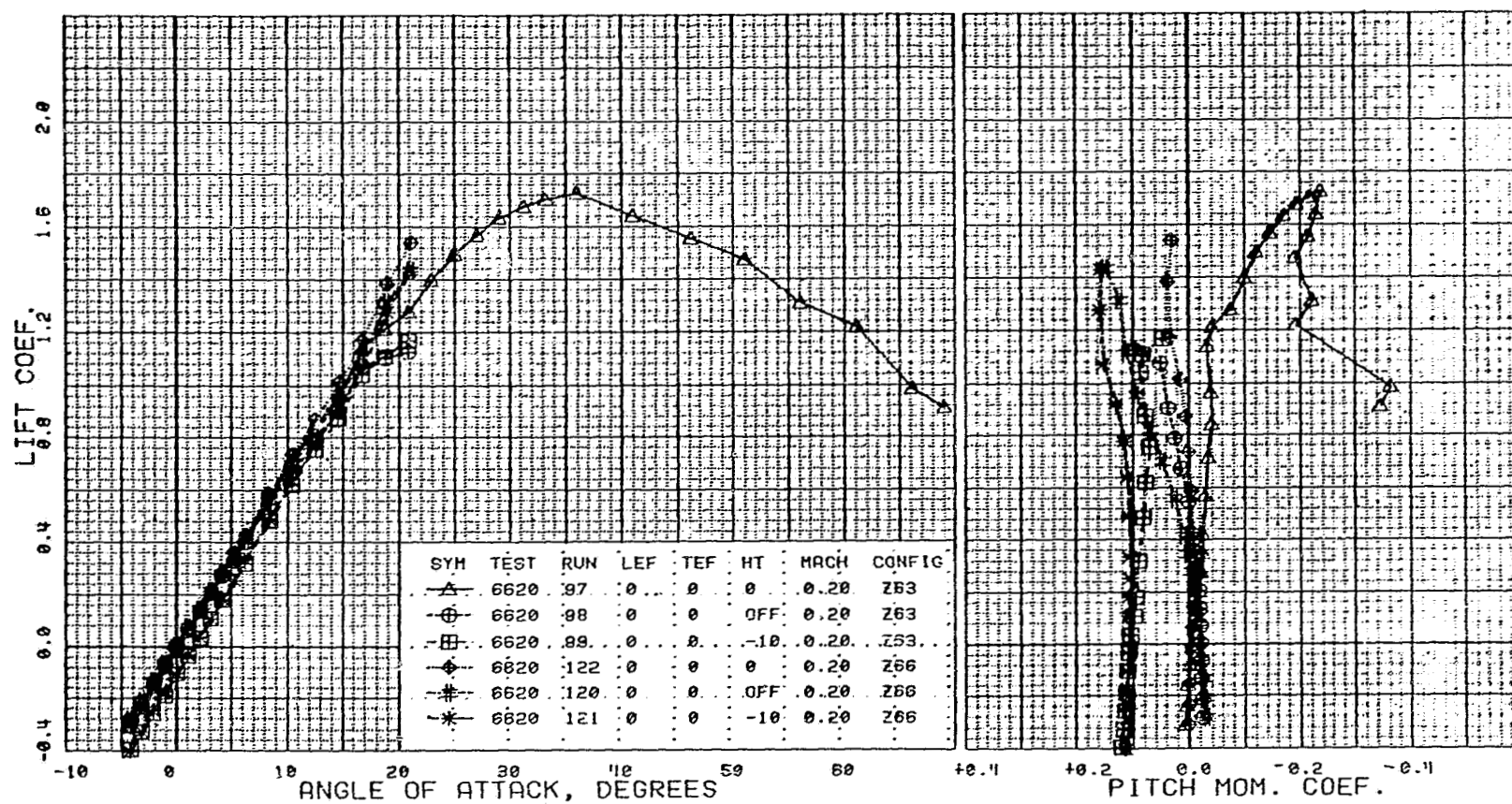


Figure 1-14 Effect of Horizontal Tail Deflection with Strakes Z63 and Z66, YF-16 + j30.5 Stretch, LEF=0
(a) Lift and Pitching Moment

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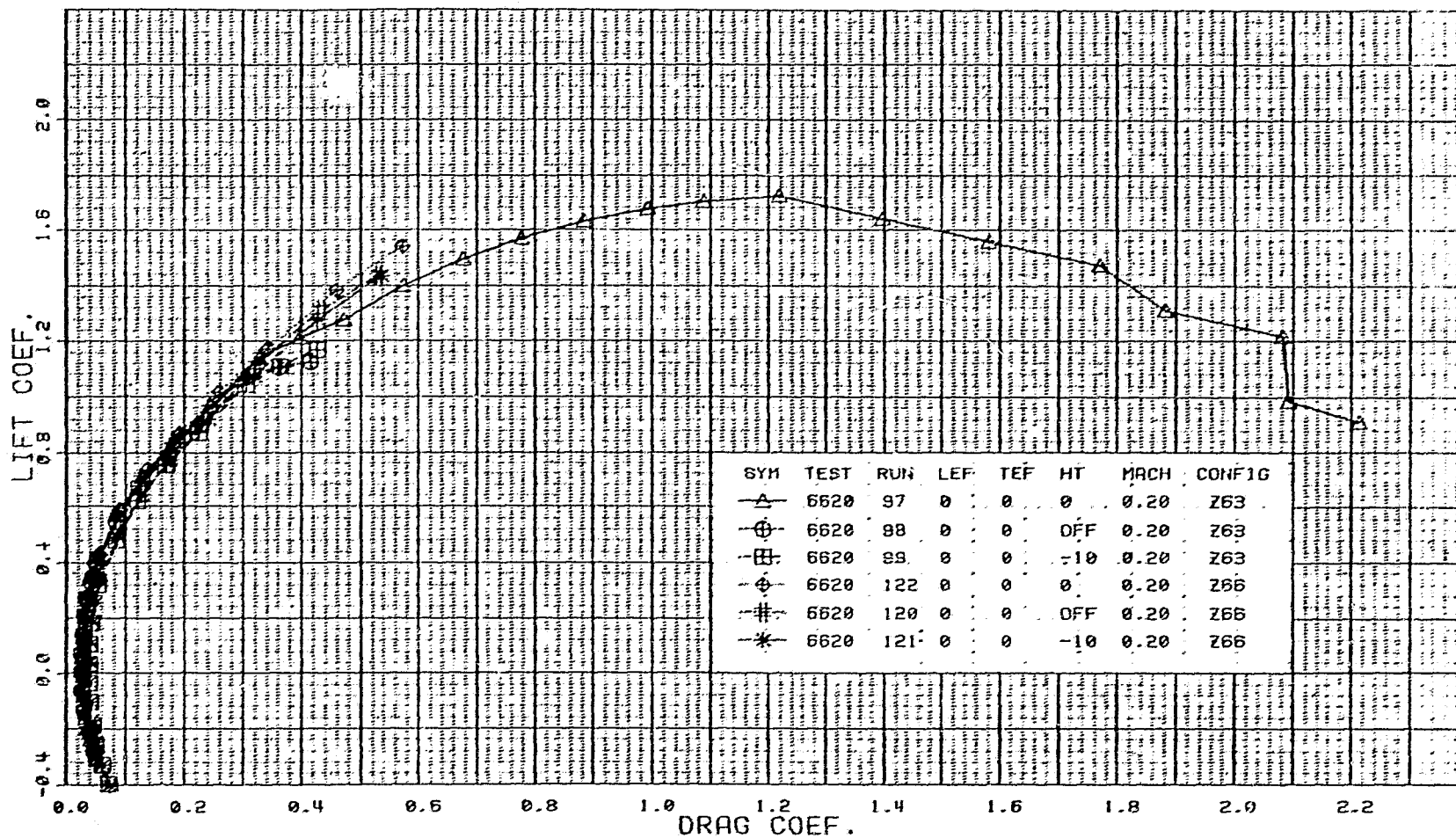


Figure 1-14 (b) Drag

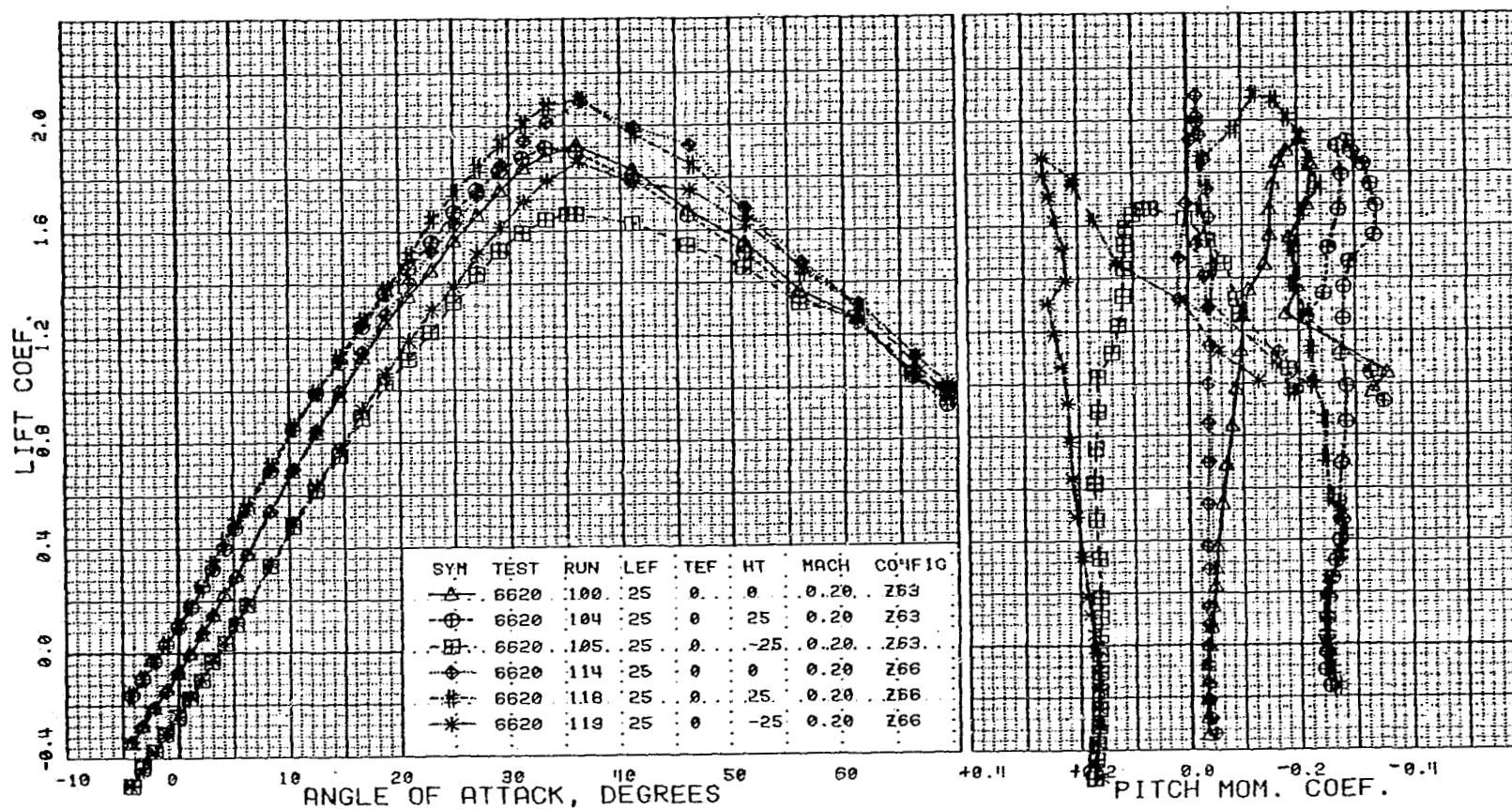


Figure 1-15 Effect of Horizontal Tail Deflection with Strakes Z63 and Z66, YF-16 + 30.5 Stretch, LEF=25°
(a) Lift and Pitching Moment

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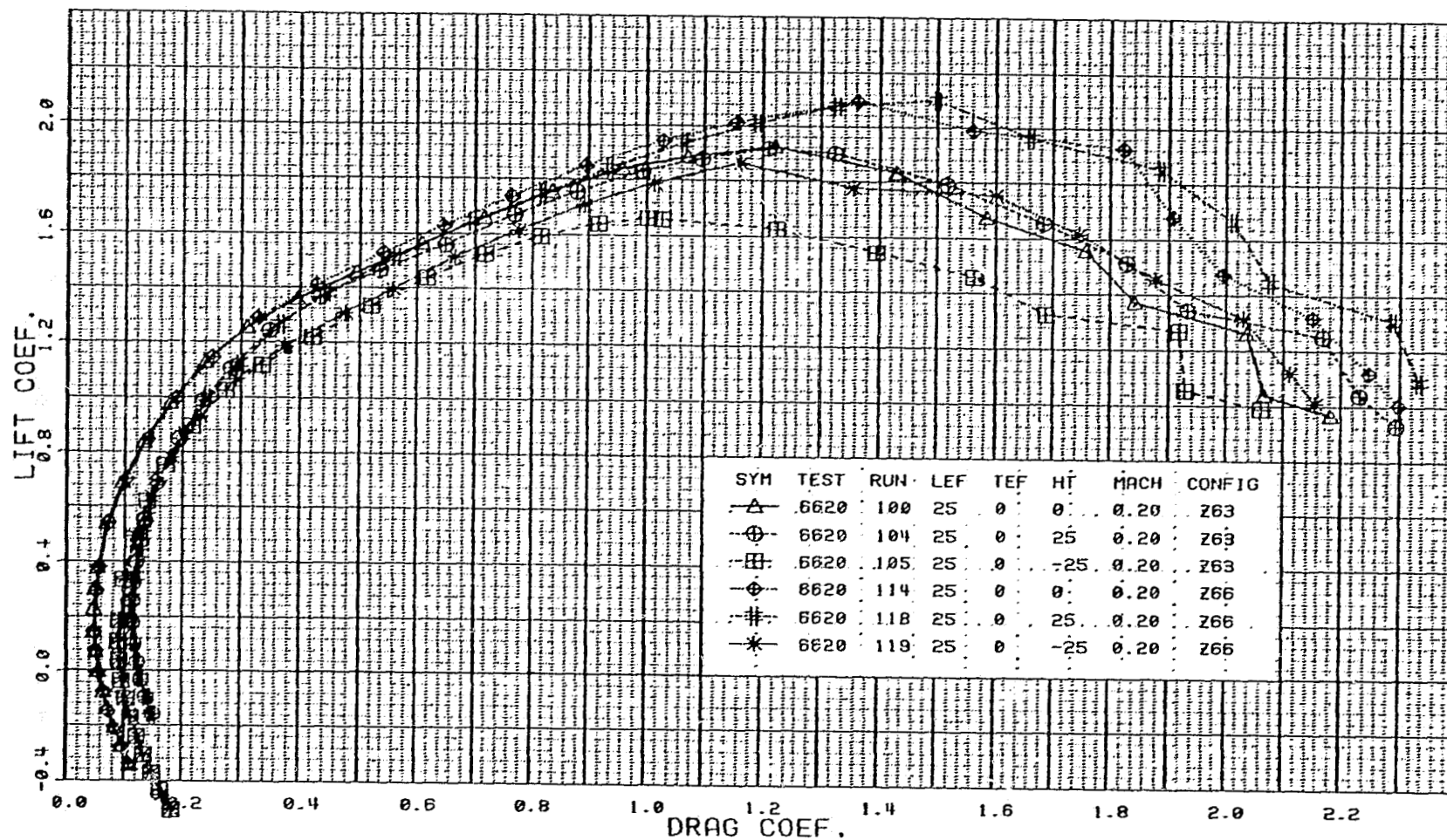
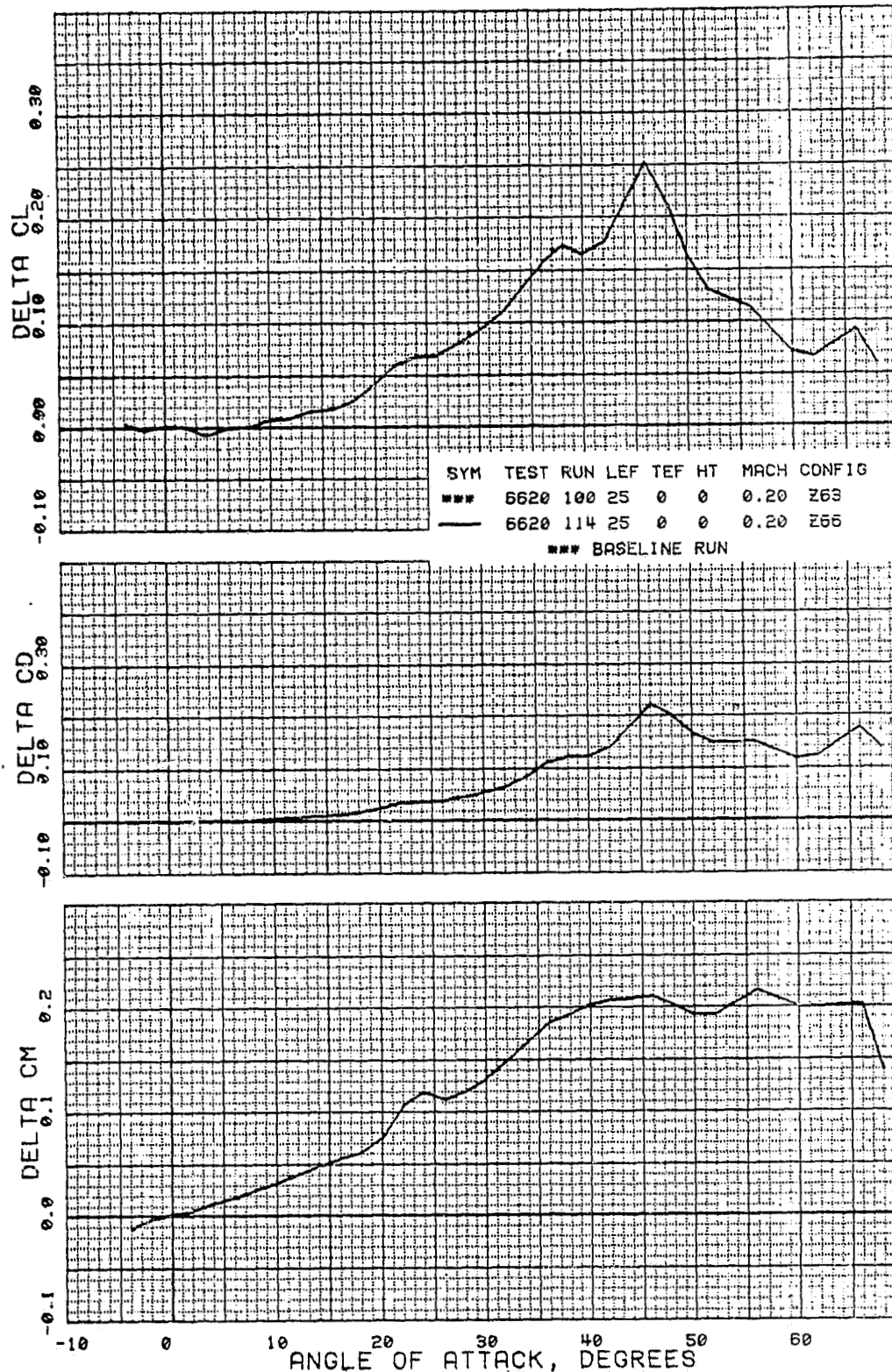


Figure 1-15 (b) Drag

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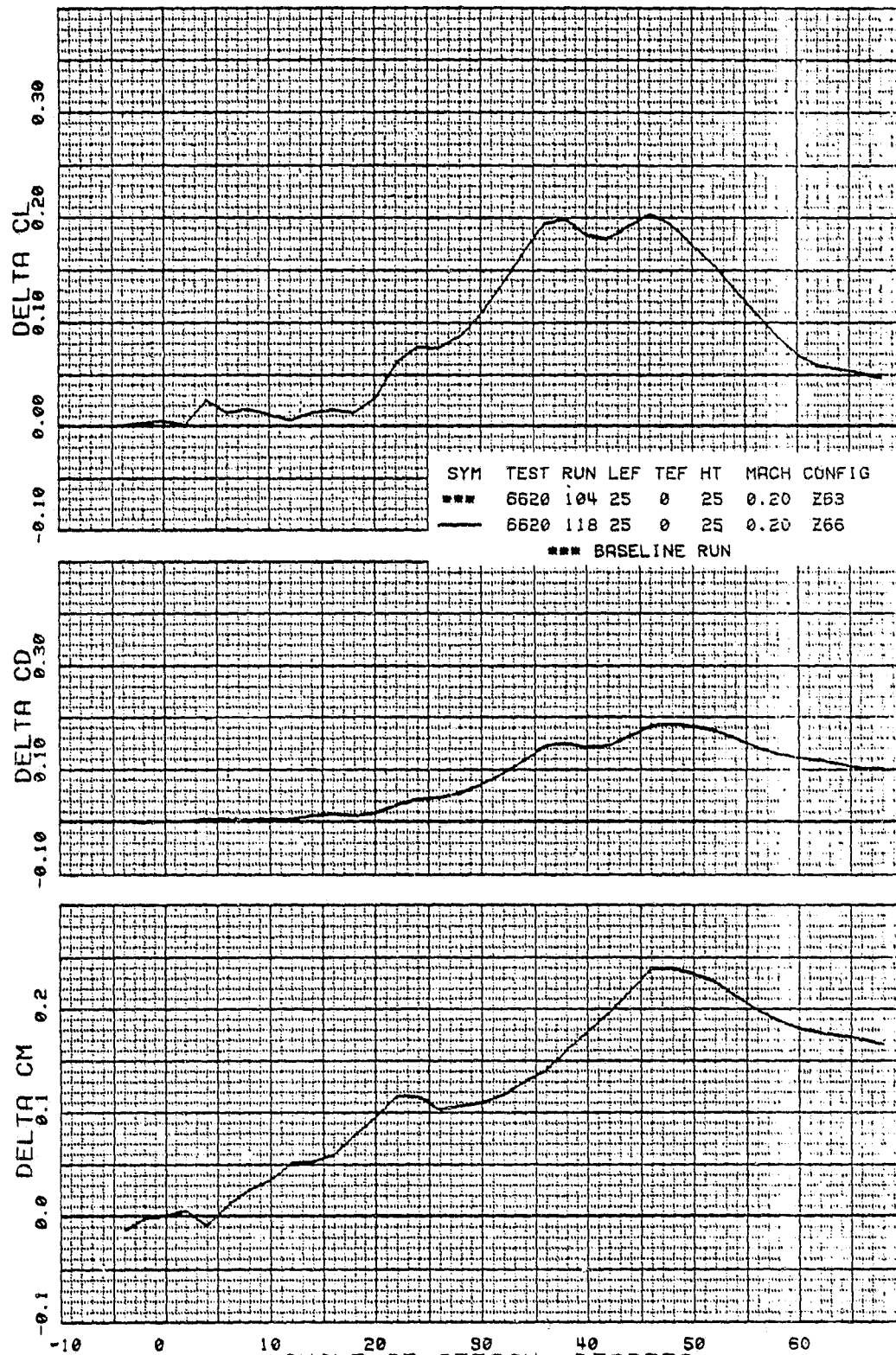


Figure 1-15 (d) Increments, HT=25°

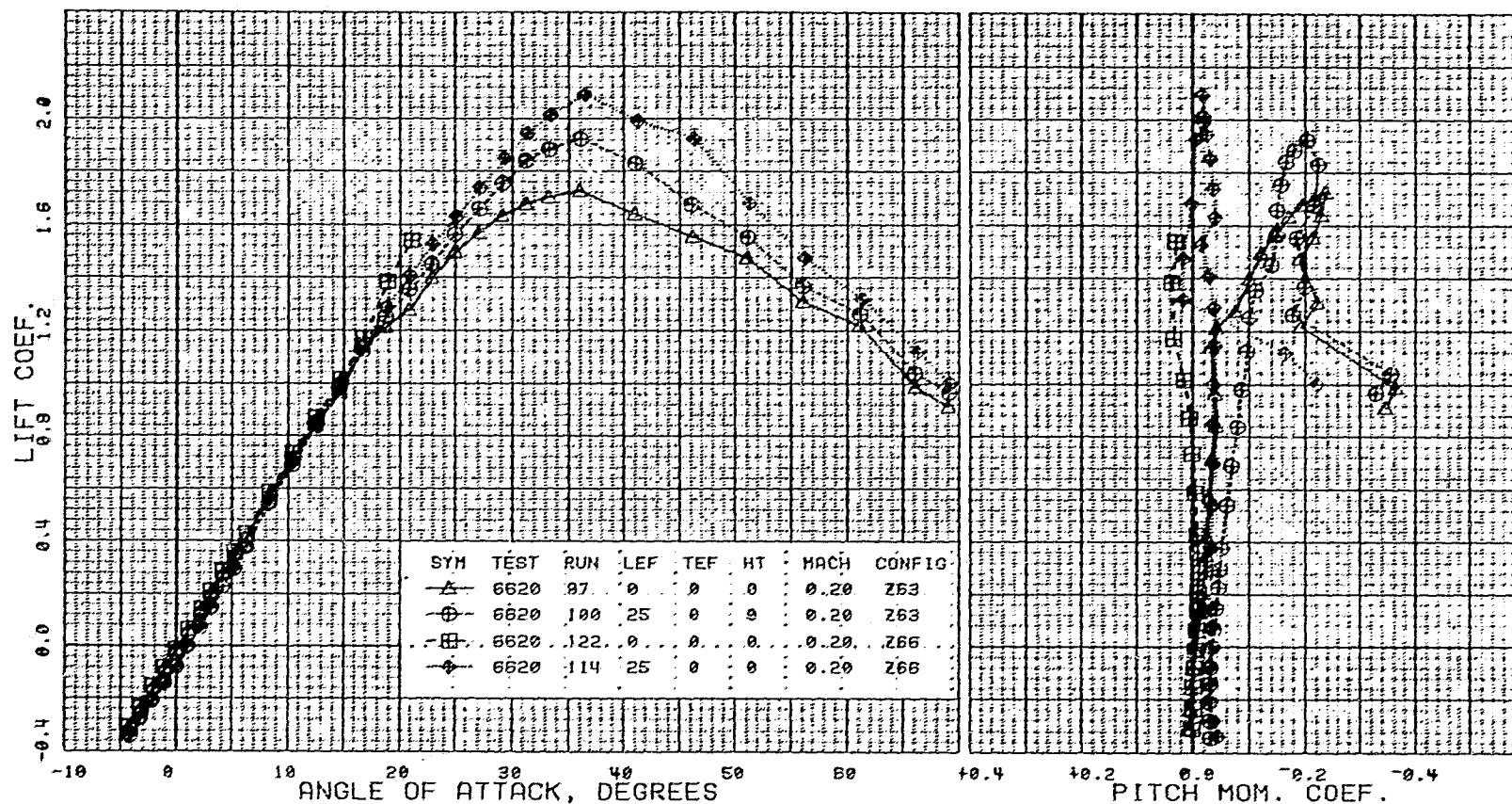


Figure 1-16 Effect of Leading-Edge Flap Deflection with Strakes Z63 and Z66, YF-16 + 30.5 Stretch
(a) Lift and Pitching Moment

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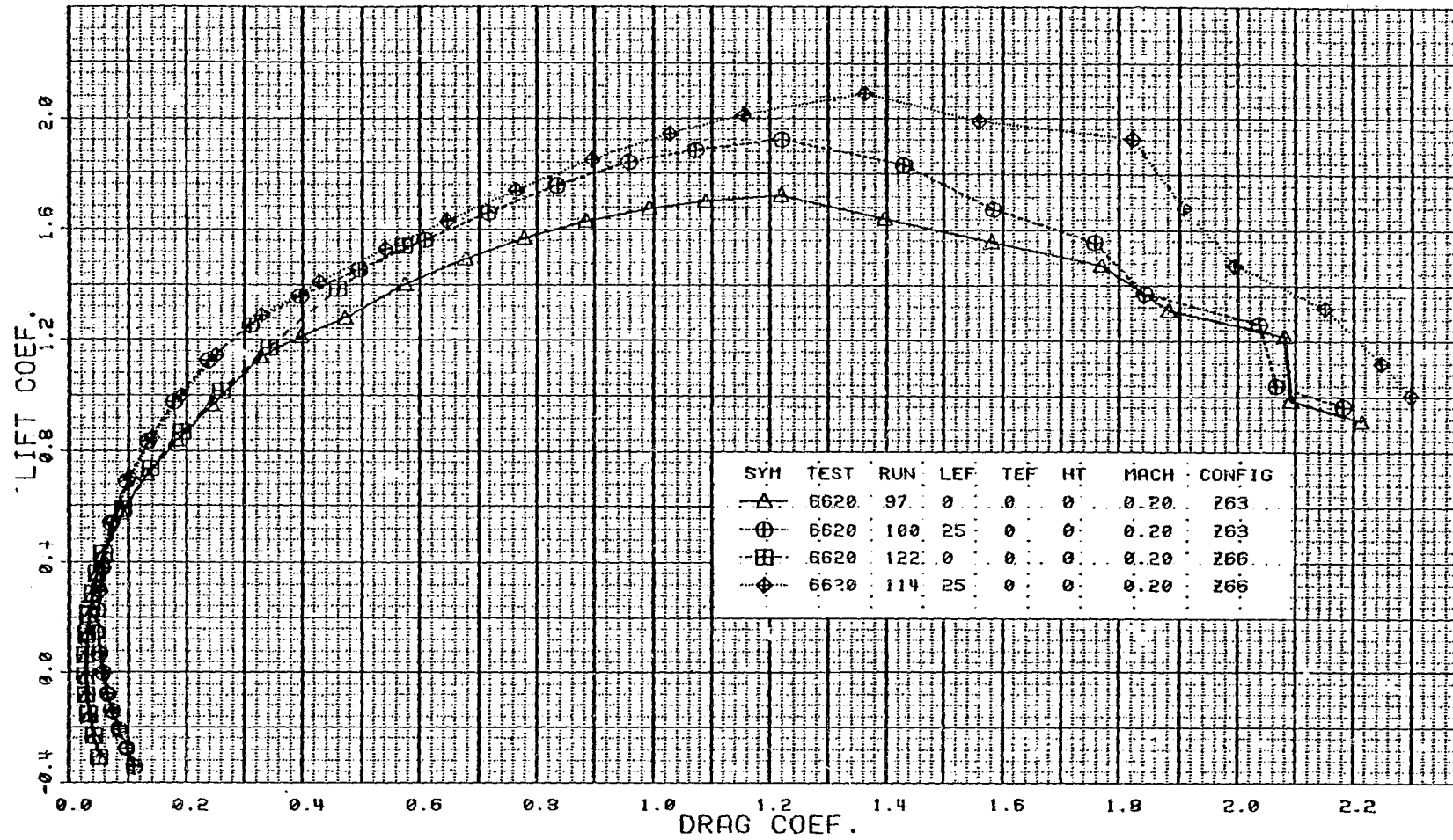


Figure 1-16 (b) Drag

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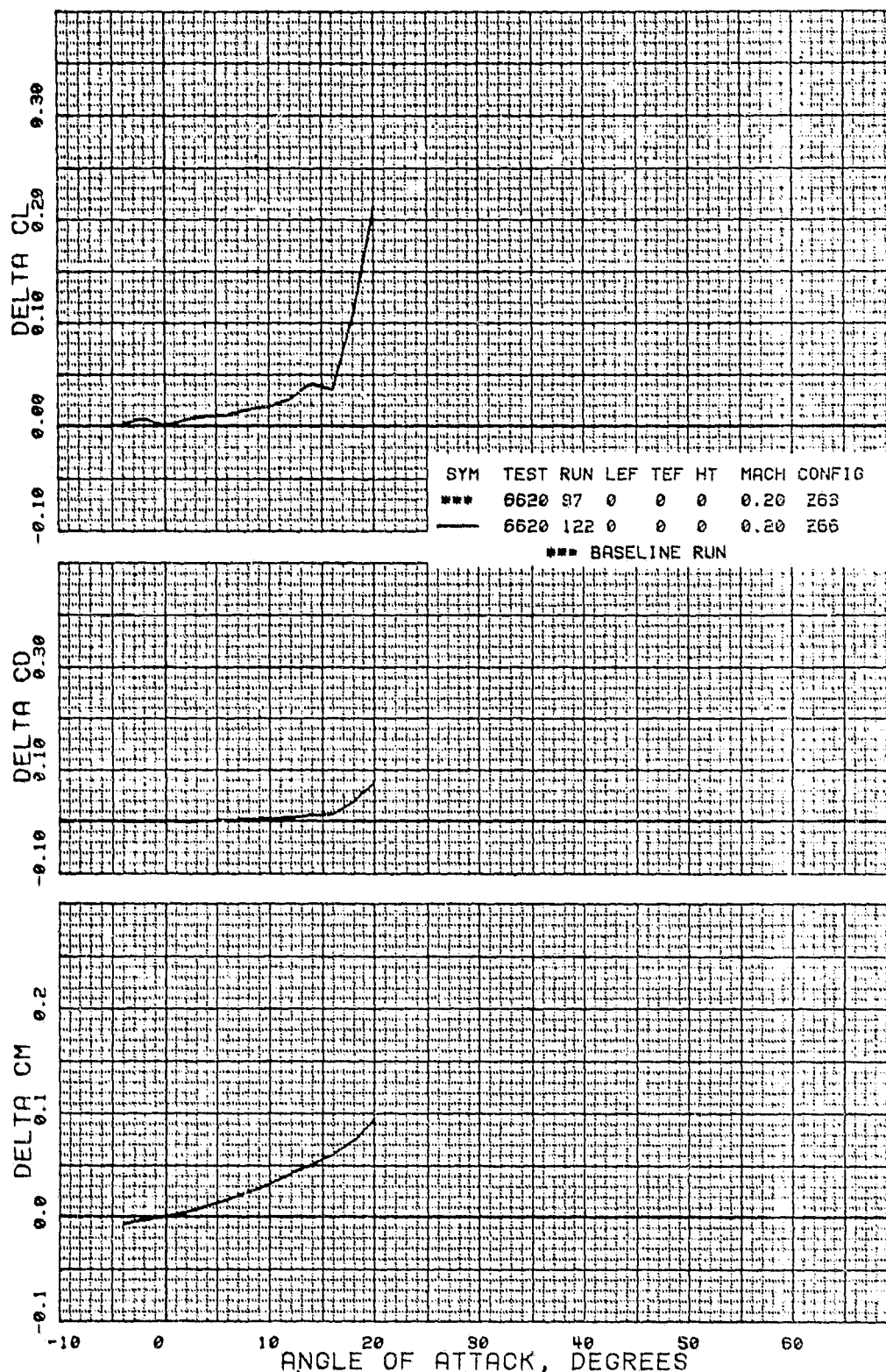


Figure 1-16 (c) Increments

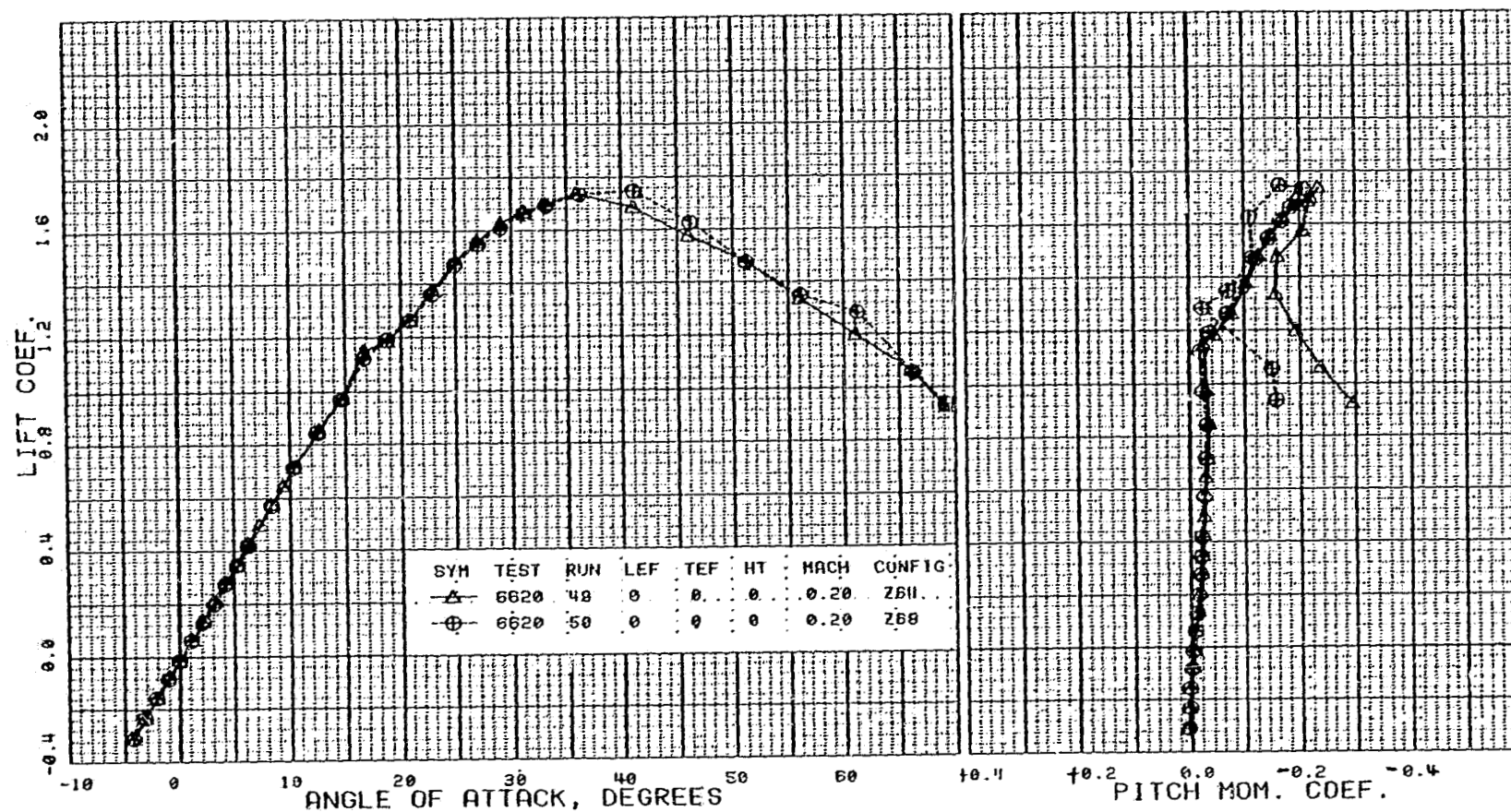


Figure 1-17 Effect of Fuselage Stretch, Z64 (30.5 Stretch) and Z68 (44.5 Stretch), LEF=0
(a) Lift and Pitching Moment

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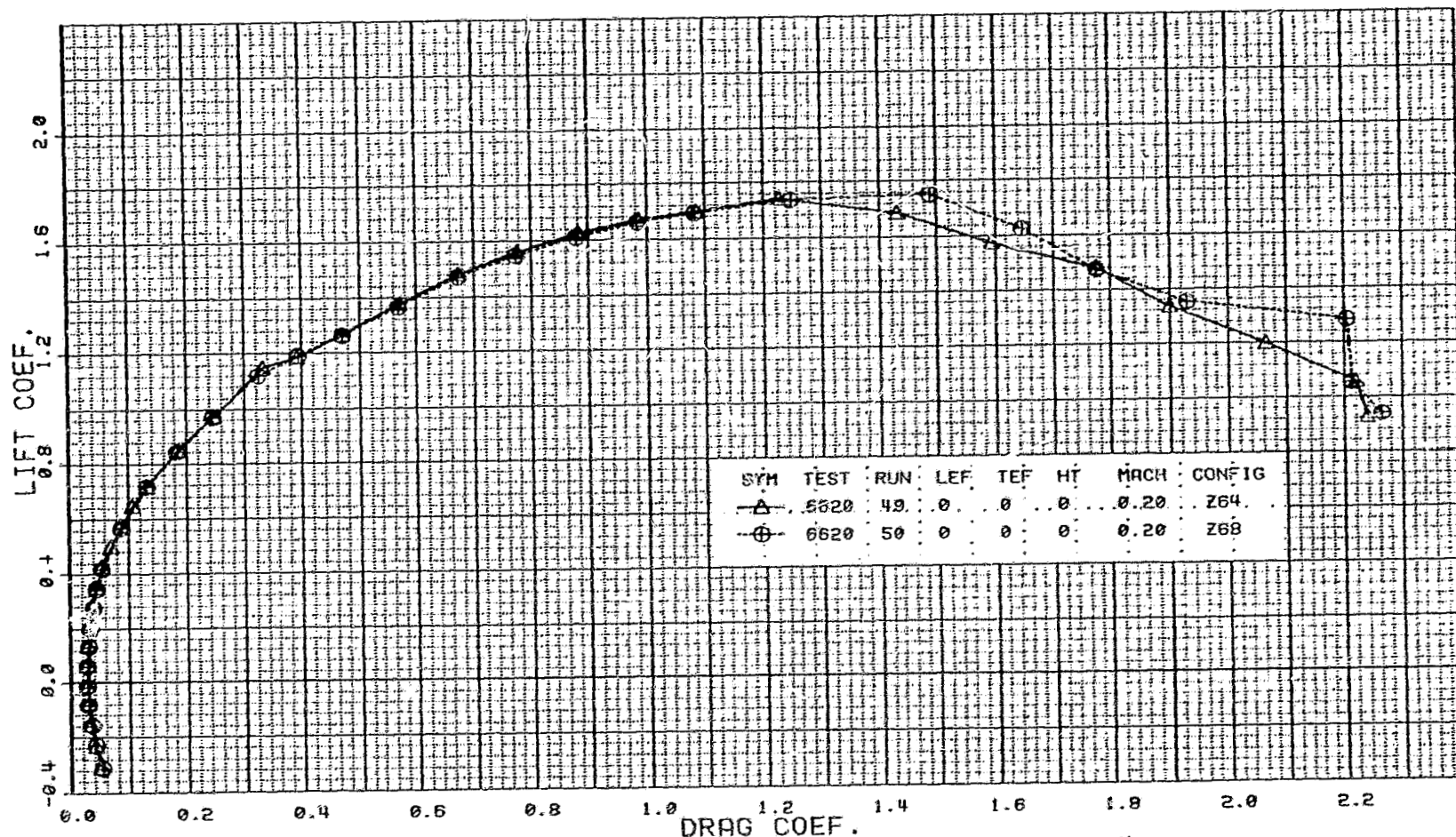


Figure 1-17 (b) Drag

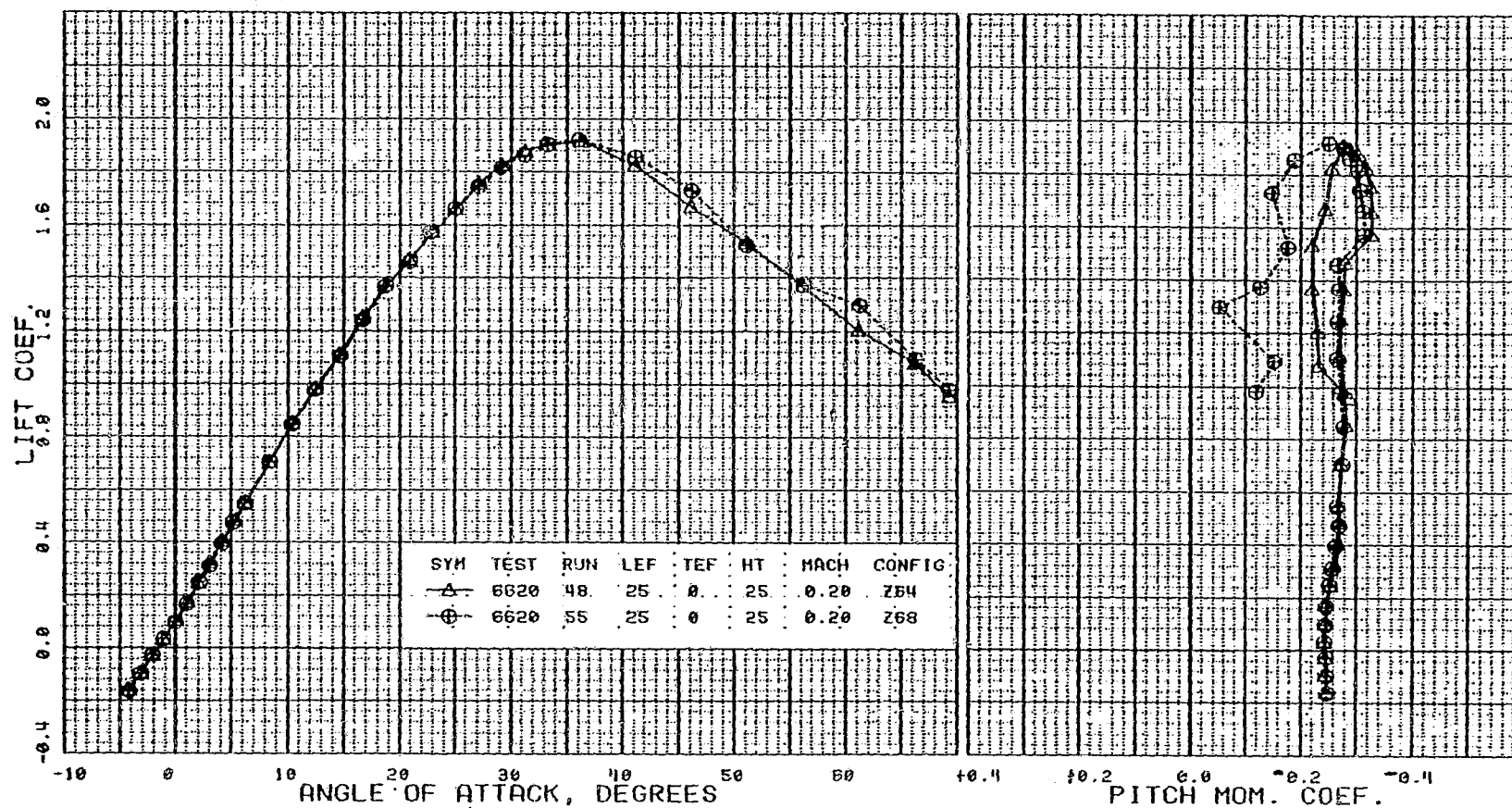


Figure 1-18 Effect of Fuselage Stretch, Z64 (30.5 Stretch) and Z68 (44.5 Stretch), LEF=25°
(a) Lift and Pitching Moment

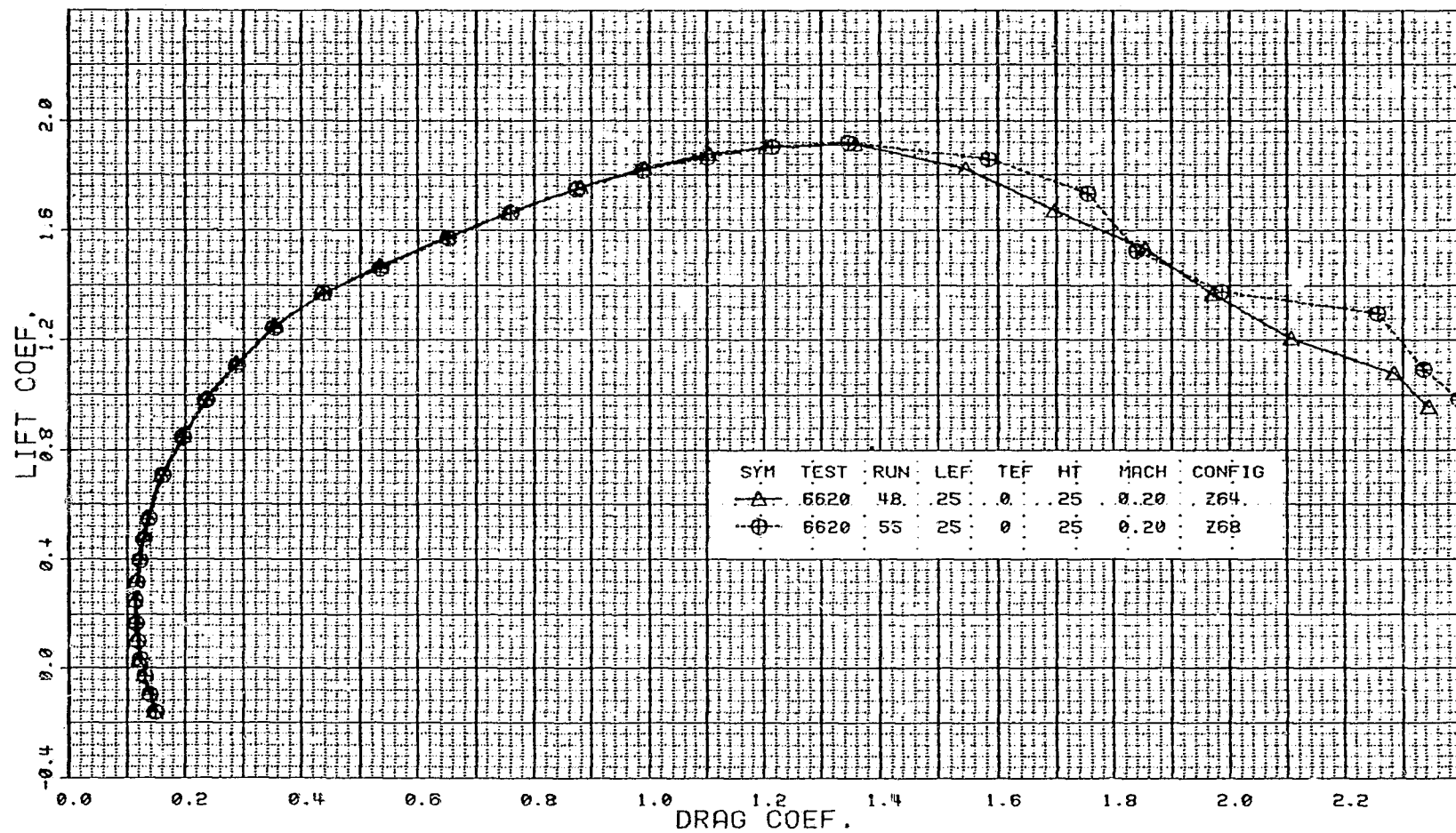


Figure 1-18 (b) Drag

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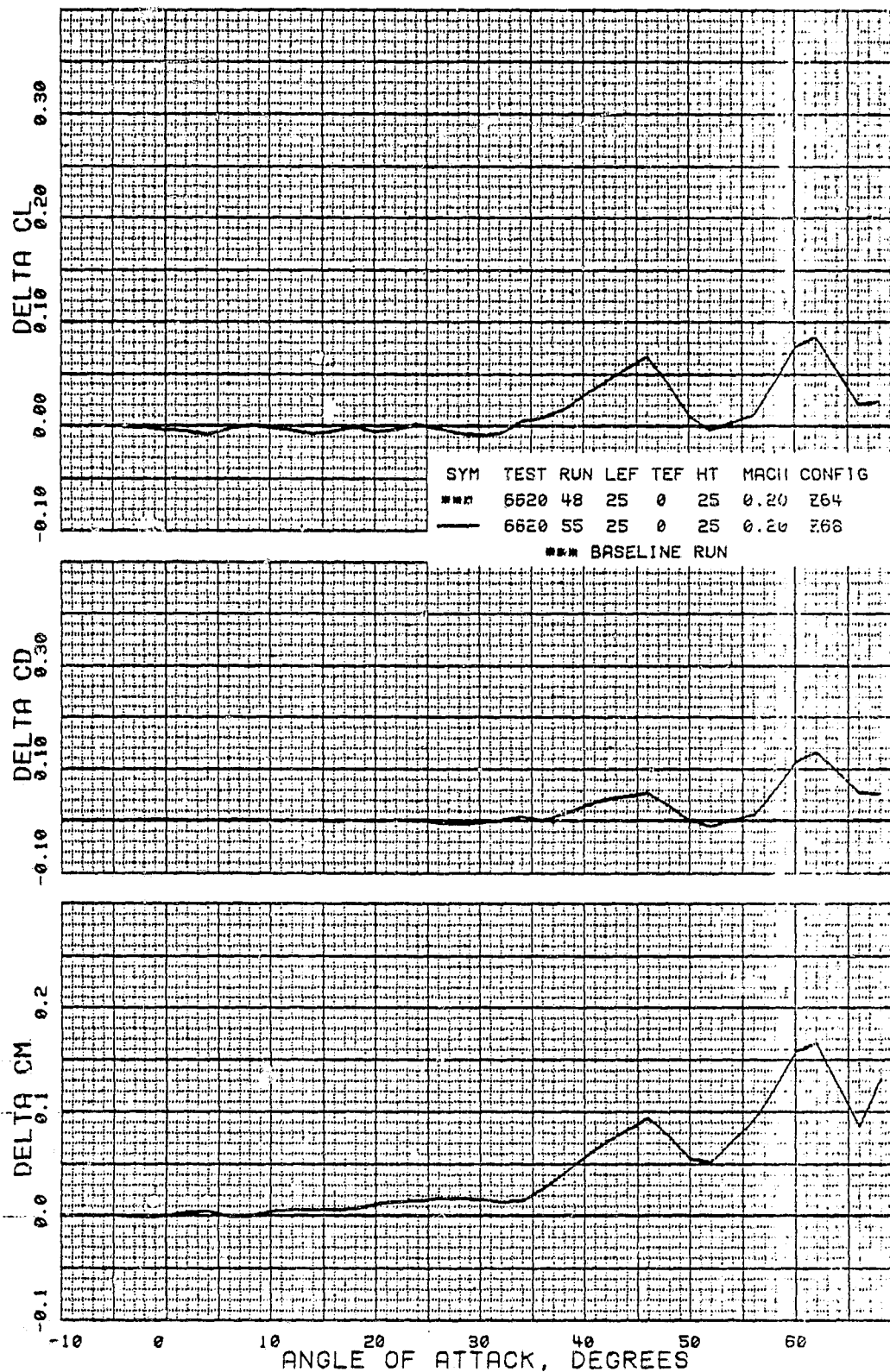


Figure 1-18 (c) Increments

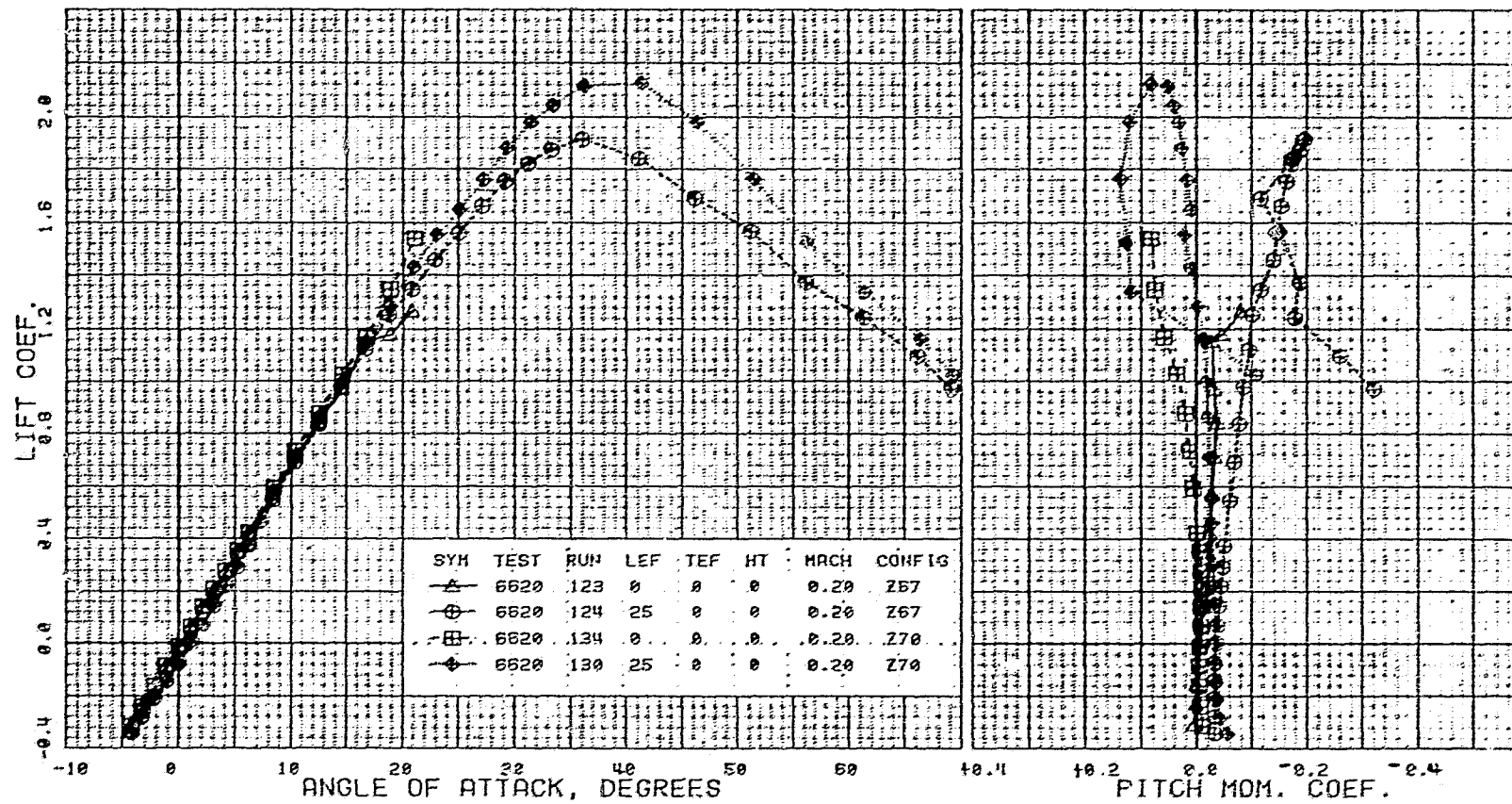


Figure 1-19 Effect of Leading Edge Flap Deflection with Strakes Z67 and Z70, YF-16 + 44.5 Stretch
(a) Lift and Pitching Moment

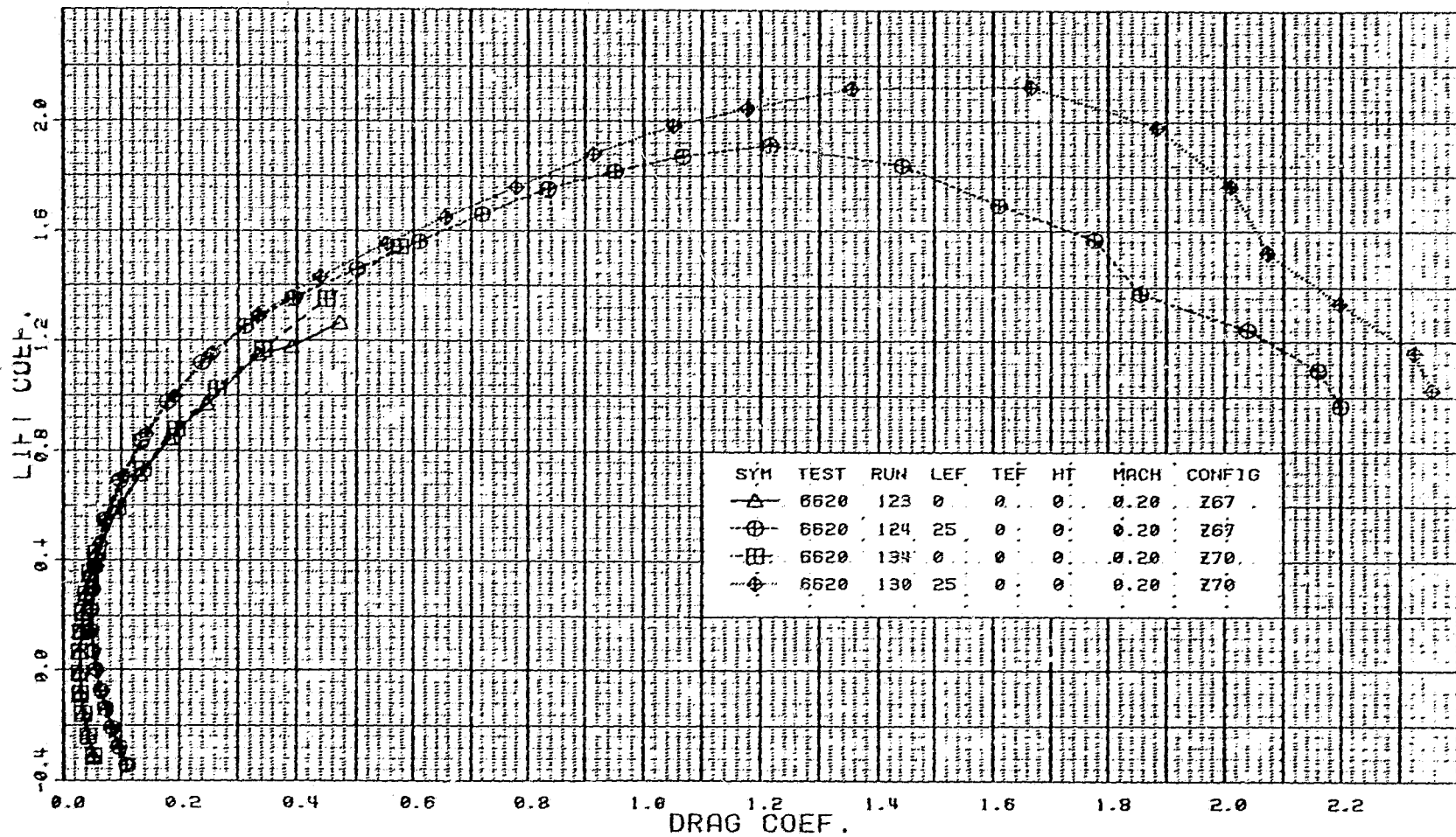


Figure 1-19 (b) Drag

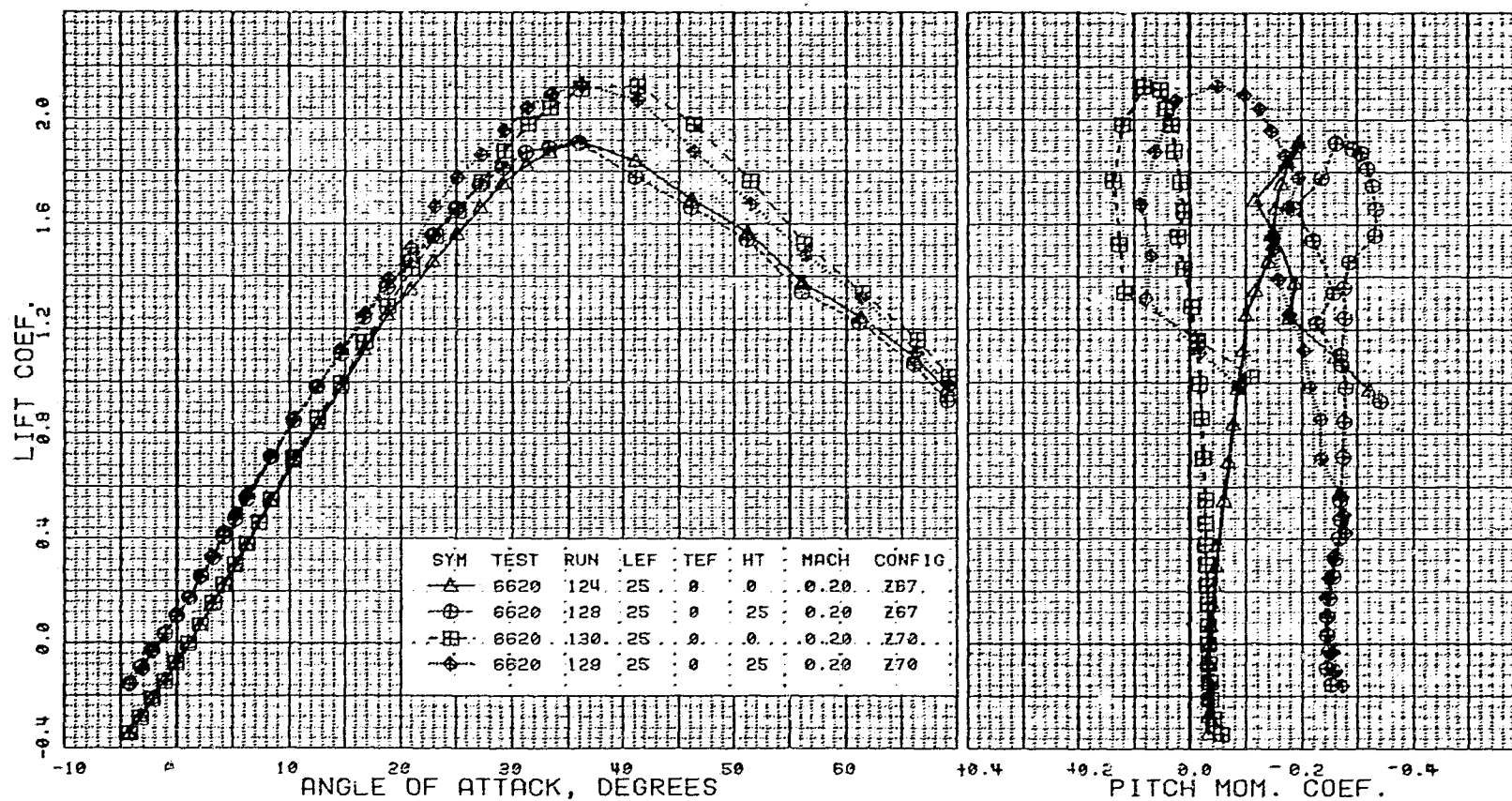


Figure 1-20 Effect of Horizontal Tail Deflection with Strakes Z67 and Z70, YF-16 + 44.5 Stretch
(a) Lift and Pitching Moment

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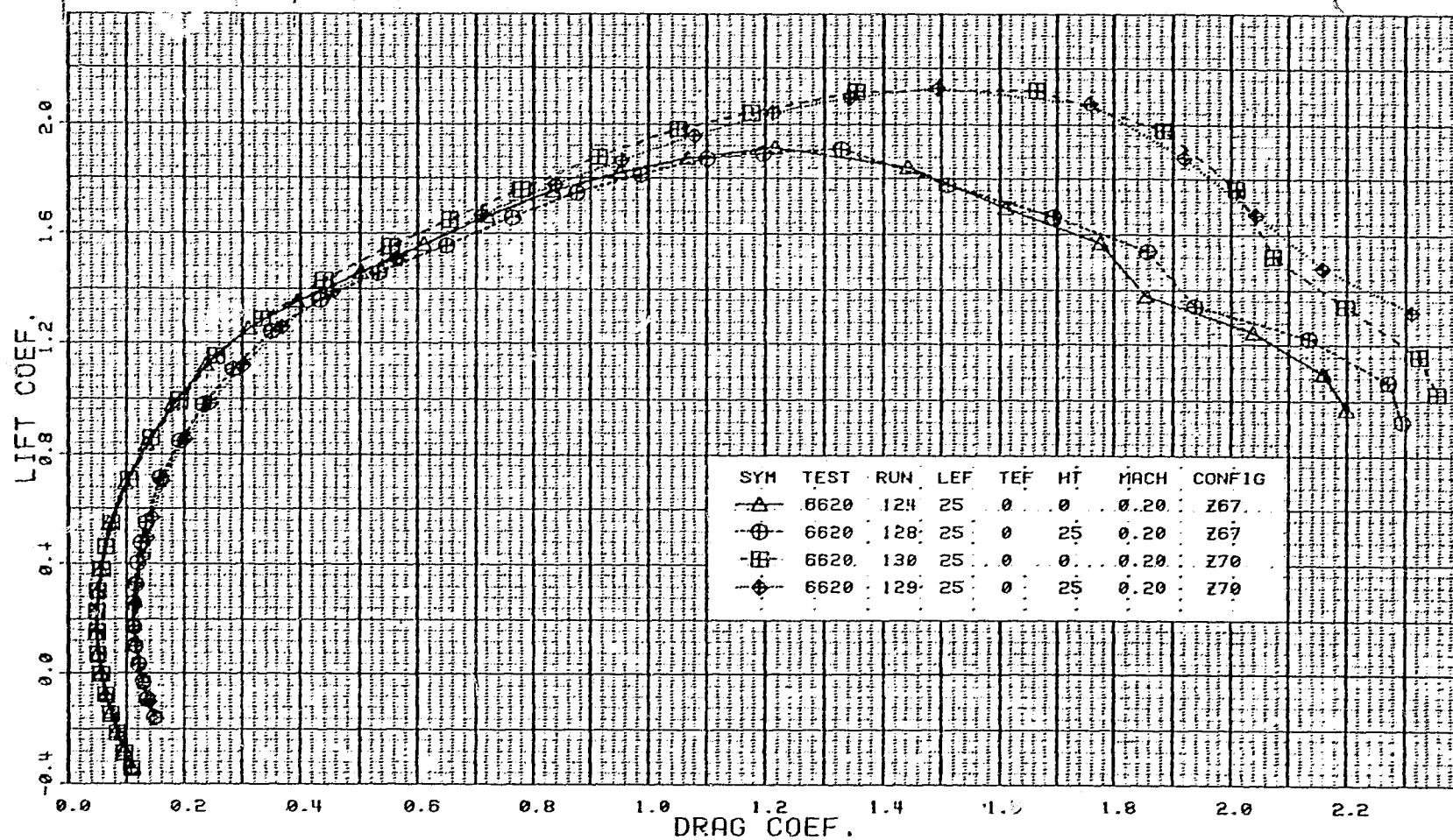
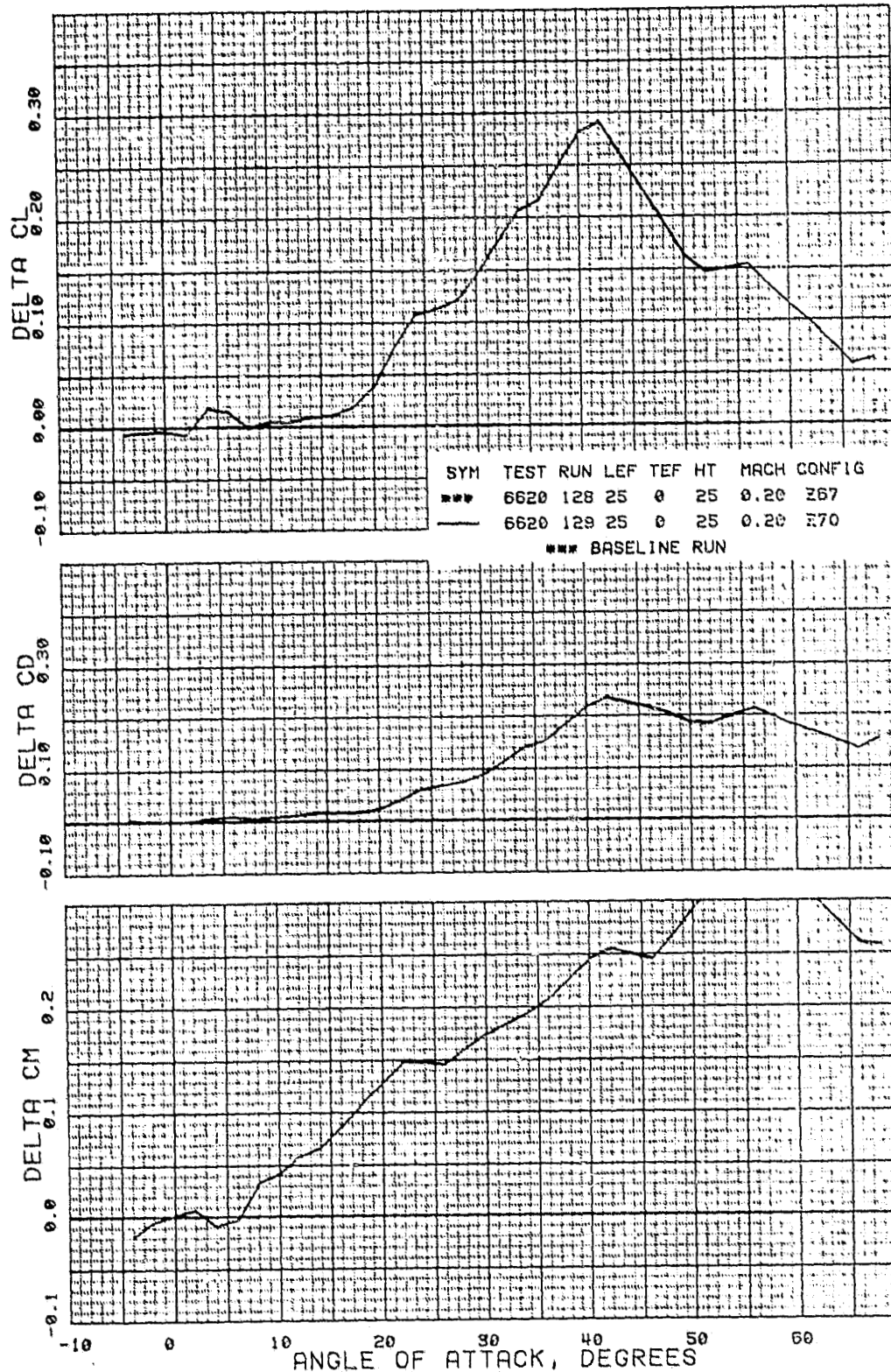


Figure 1-20 (b) Drag

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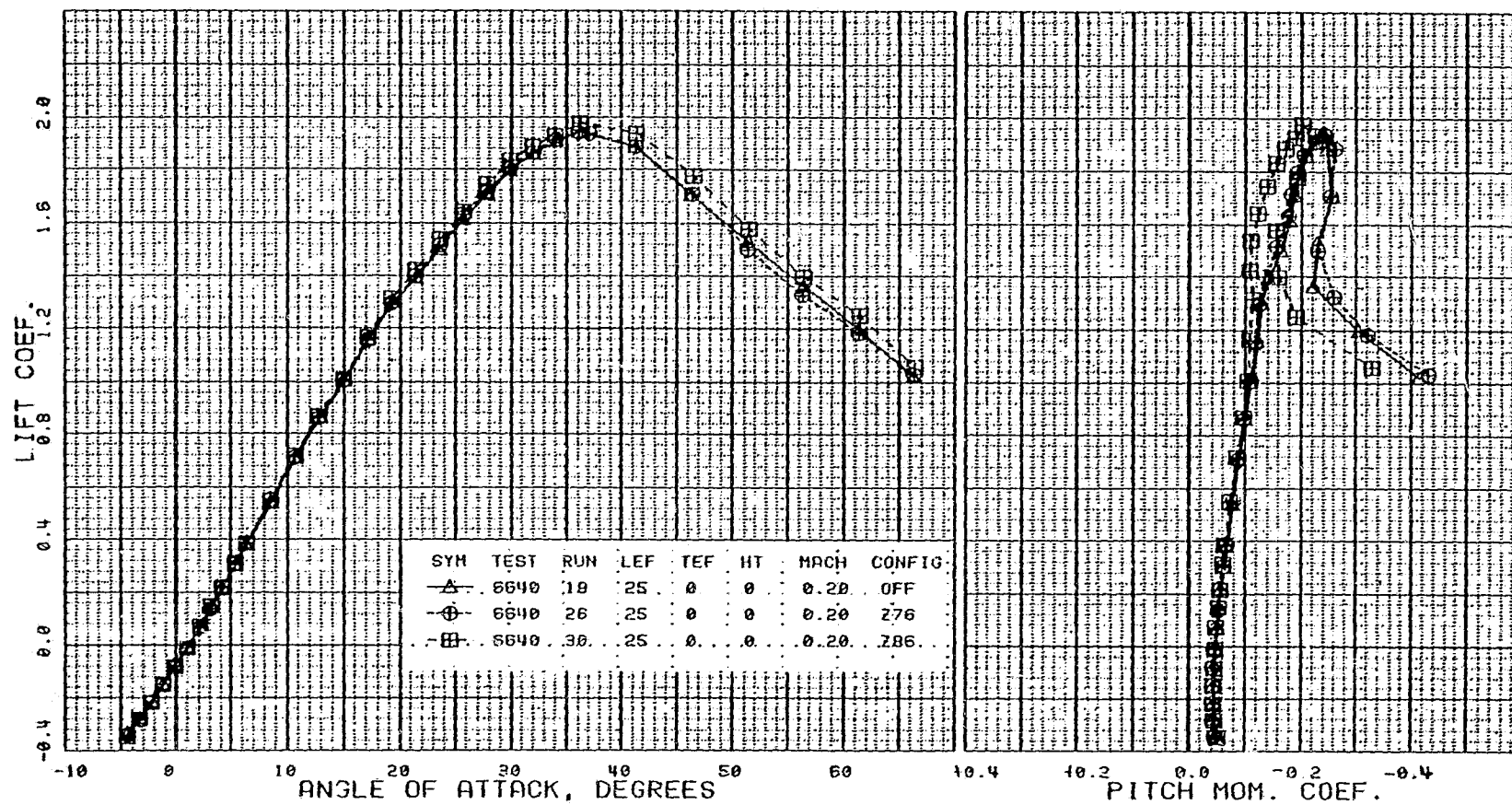


Figure 1-21 Effect of Nose, 276, and Canard, Z86, Strakes, YF-16, HT=0
(a) Lift and Pitching Moment

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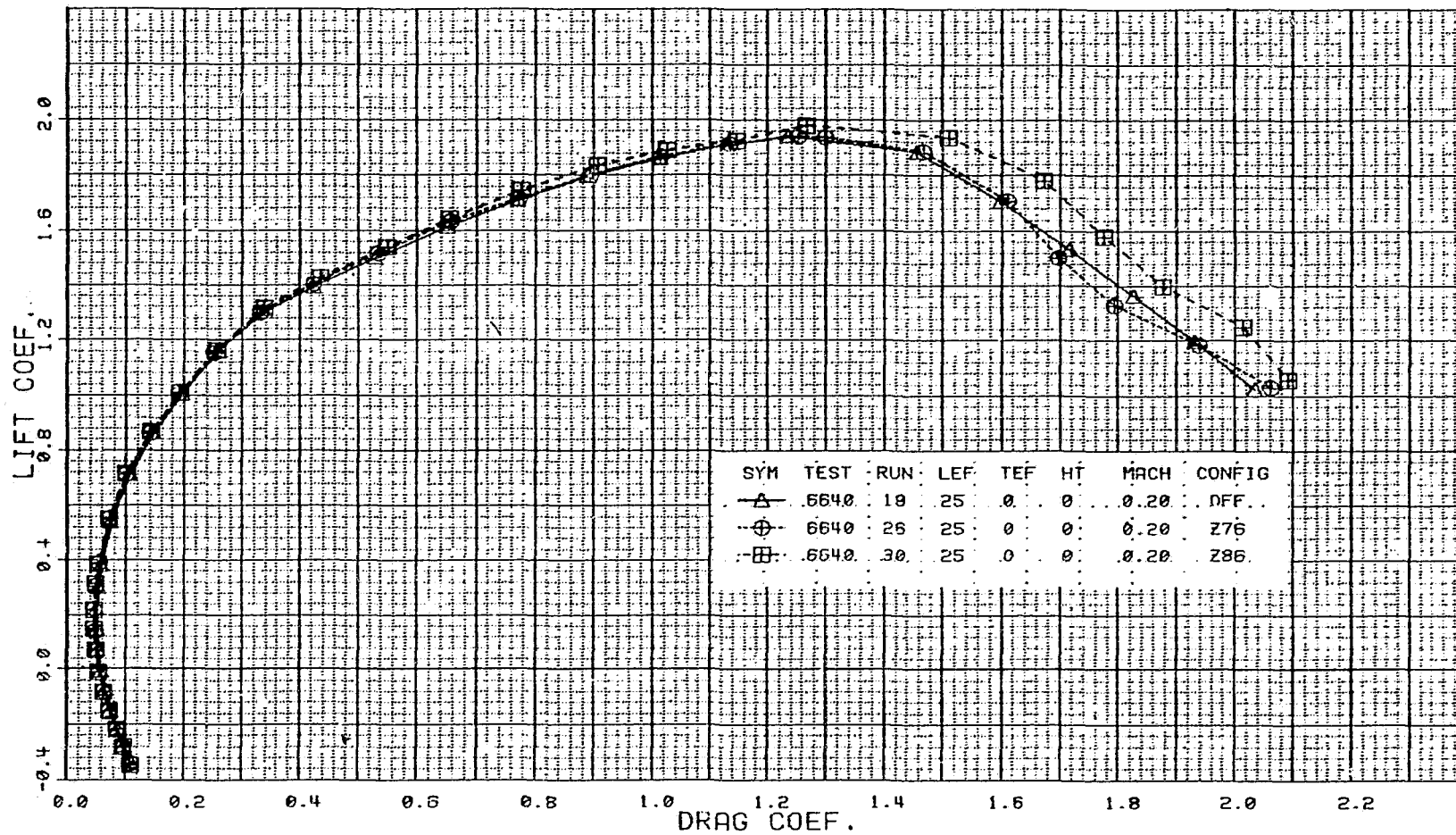


Figure 1-21 (b) Drag

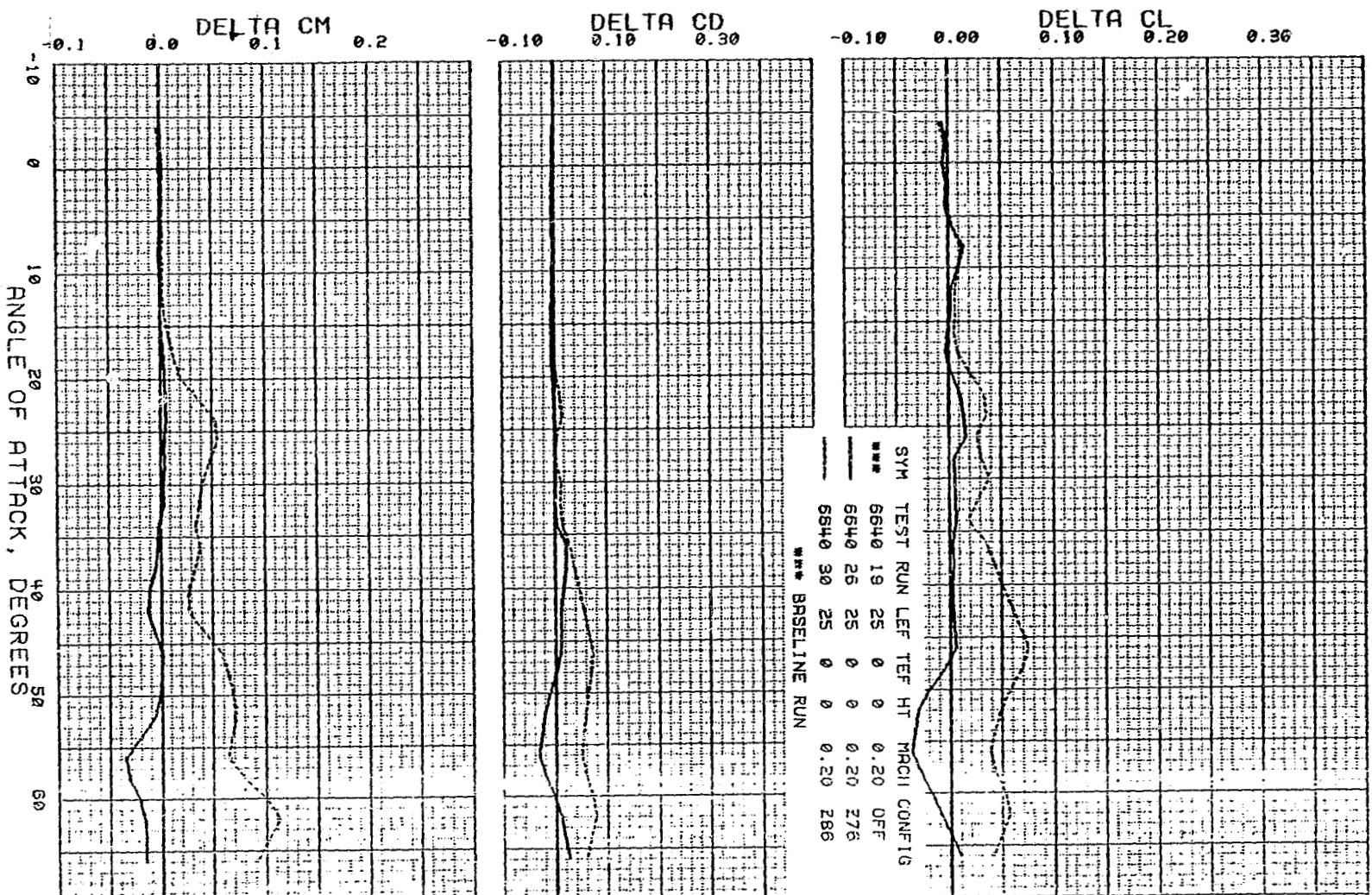


Figure 1-21 (c) Increments

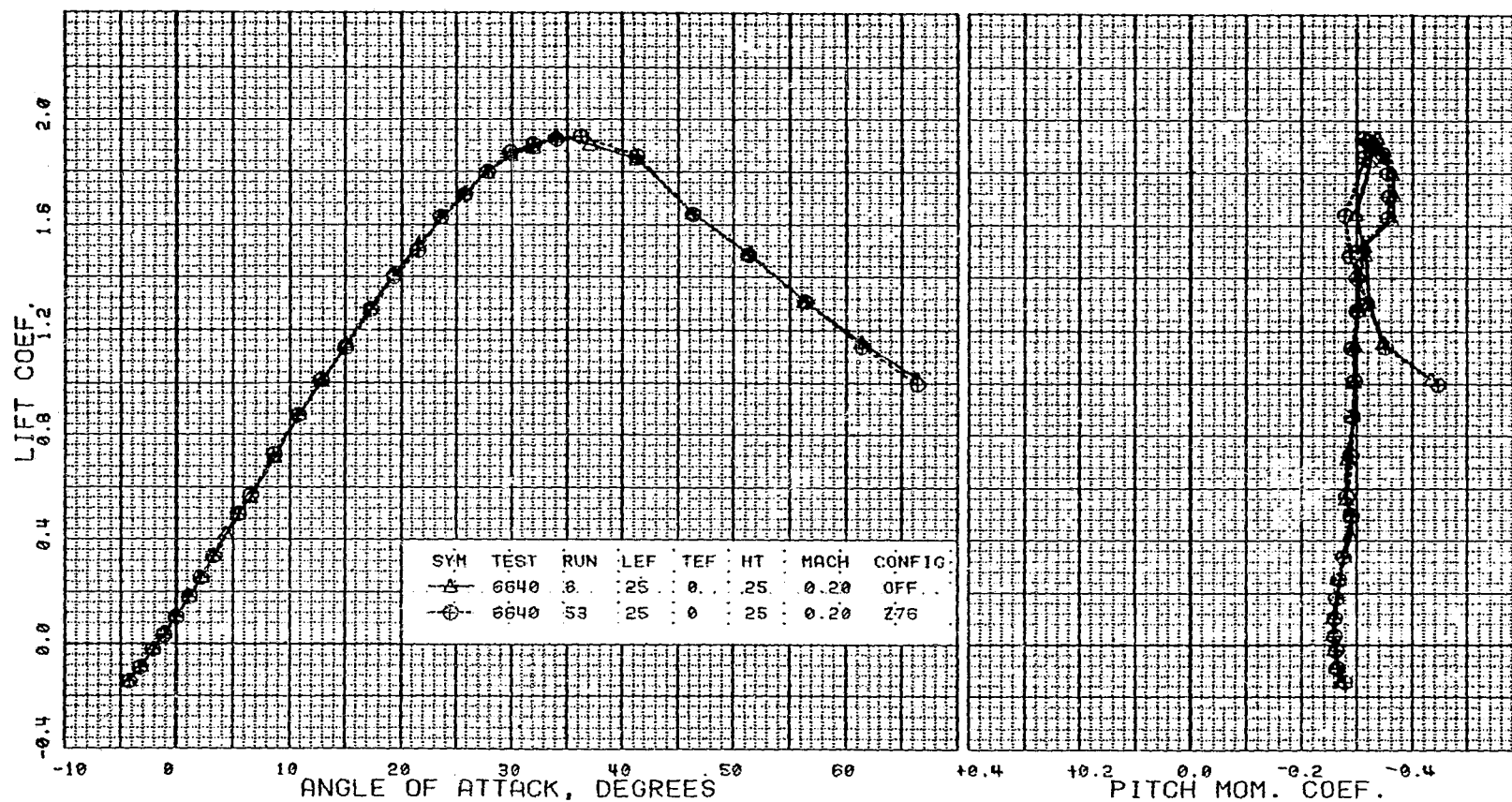


Figure 1-22 Effect of Nose Strake Z76, YF-16, HT=25°
(a) Lift and Pitching Moment

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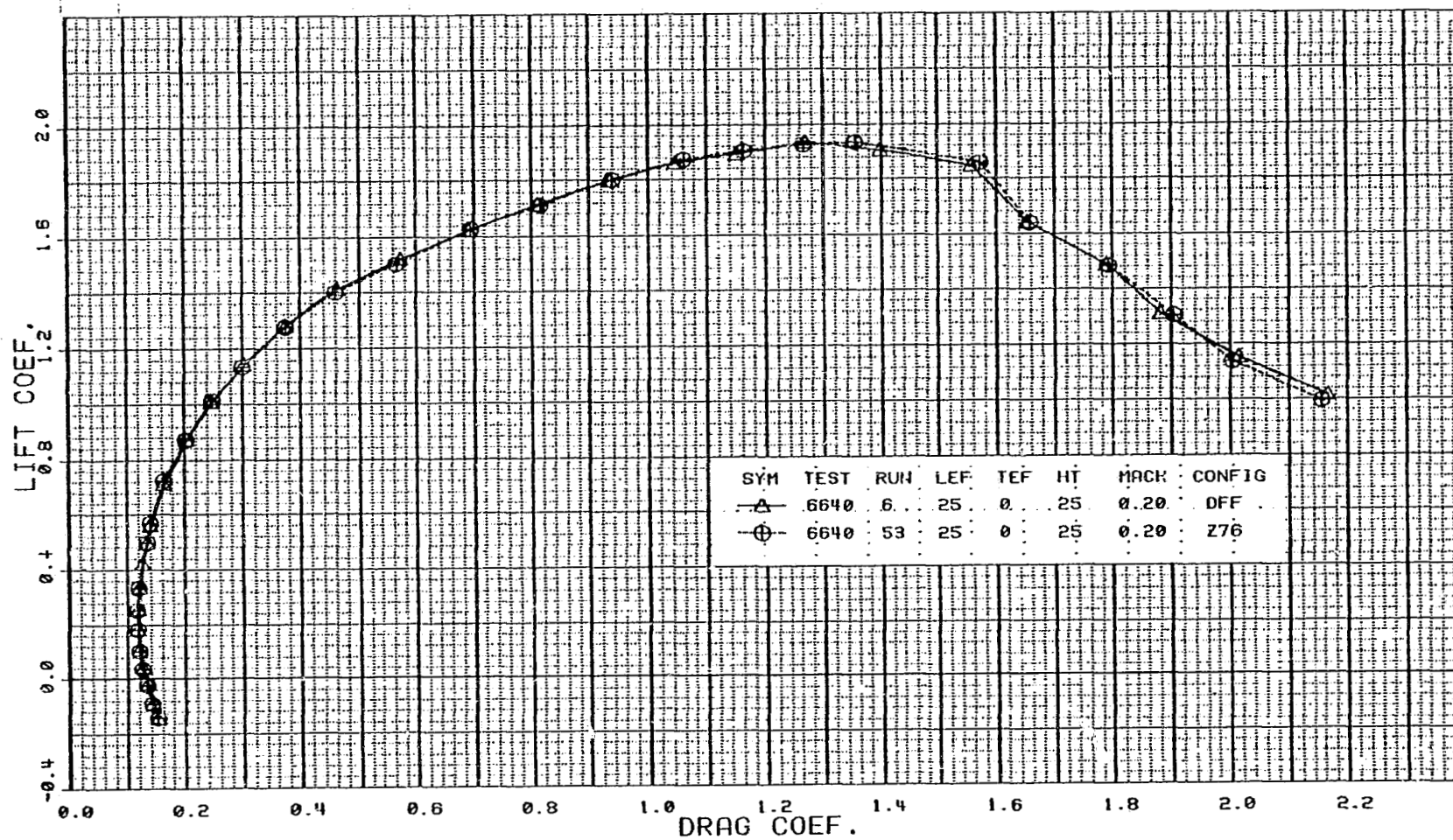


Figure 1-22 (b) Drag

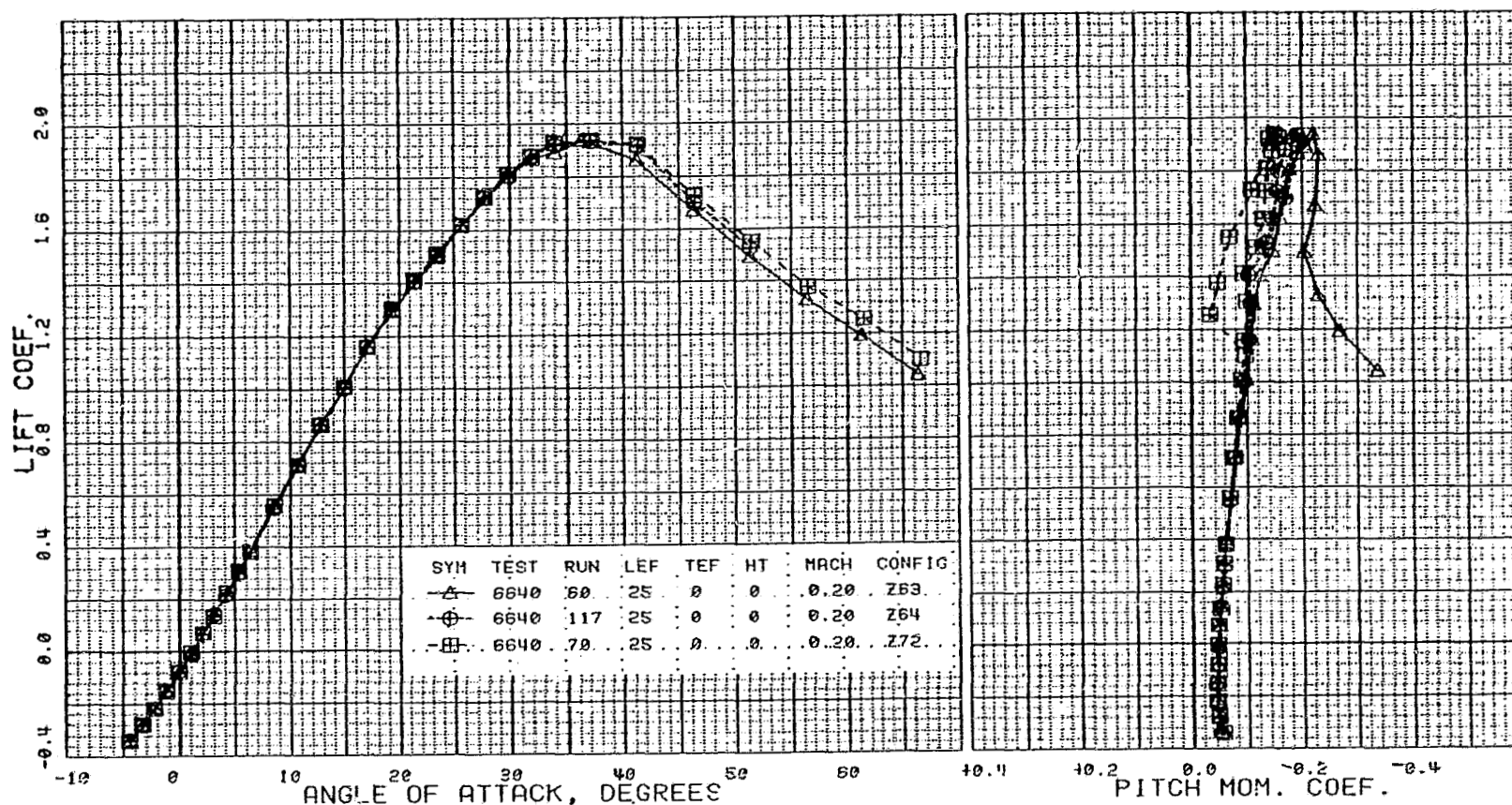


Figure 1023 Effect of Forebody Strake Forward Extent (Z63, Z64, Z72), YF-16 + 30.5 Stretch, HT=0
(a) Lift and Pitching Moment

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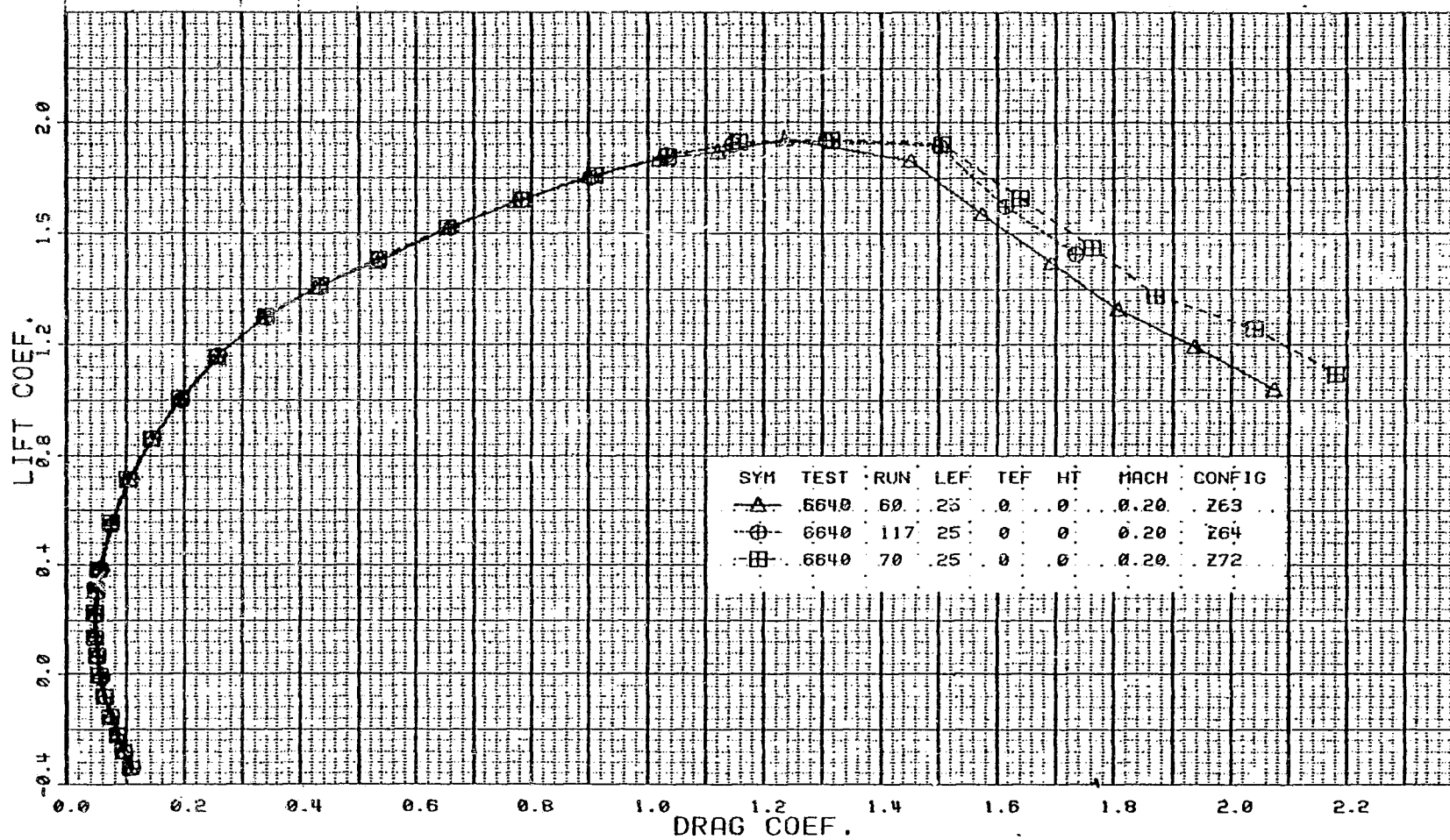


Figure 1-23 (b) Drag

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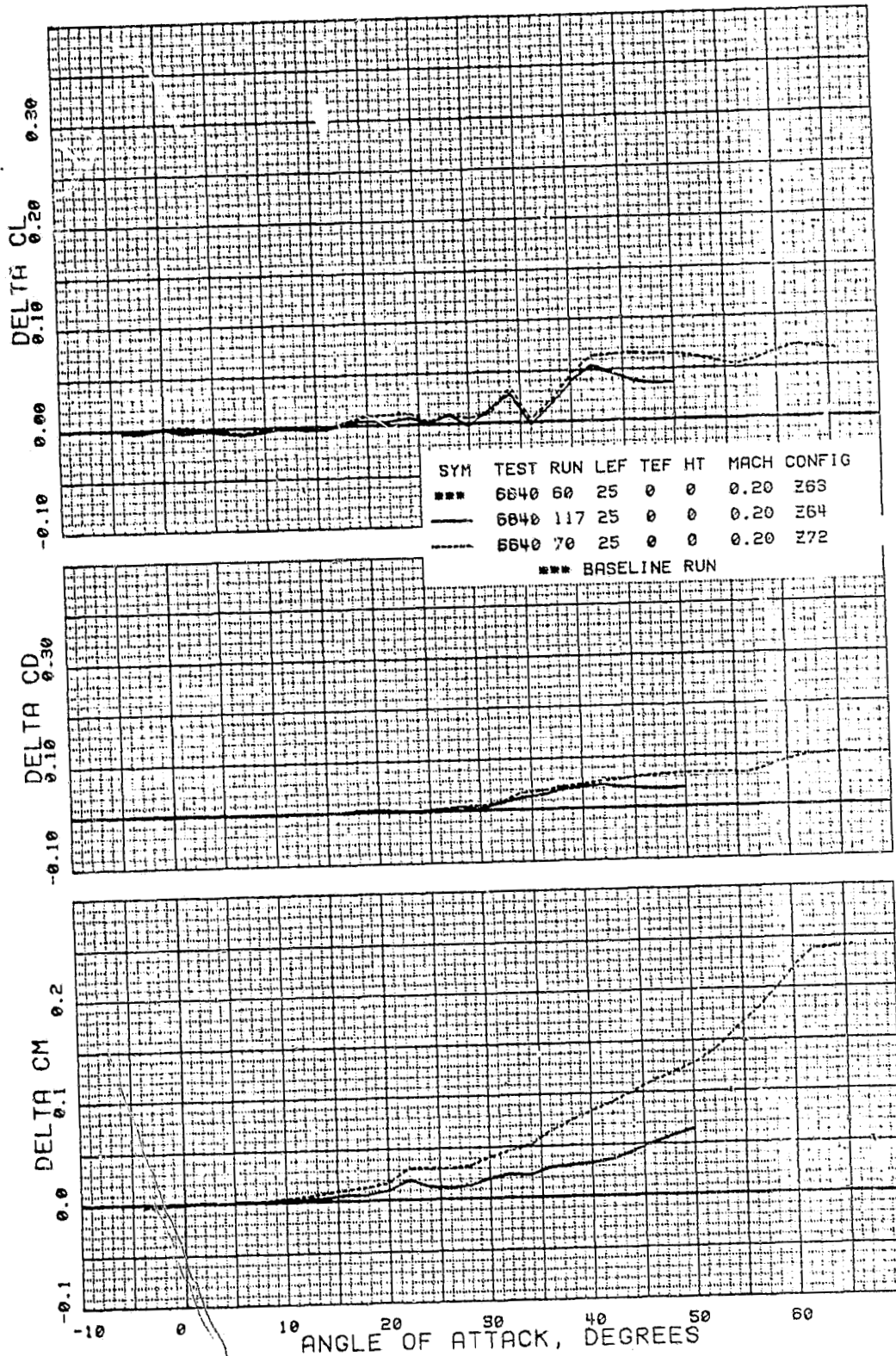


Figure 1-23 (c) Increments

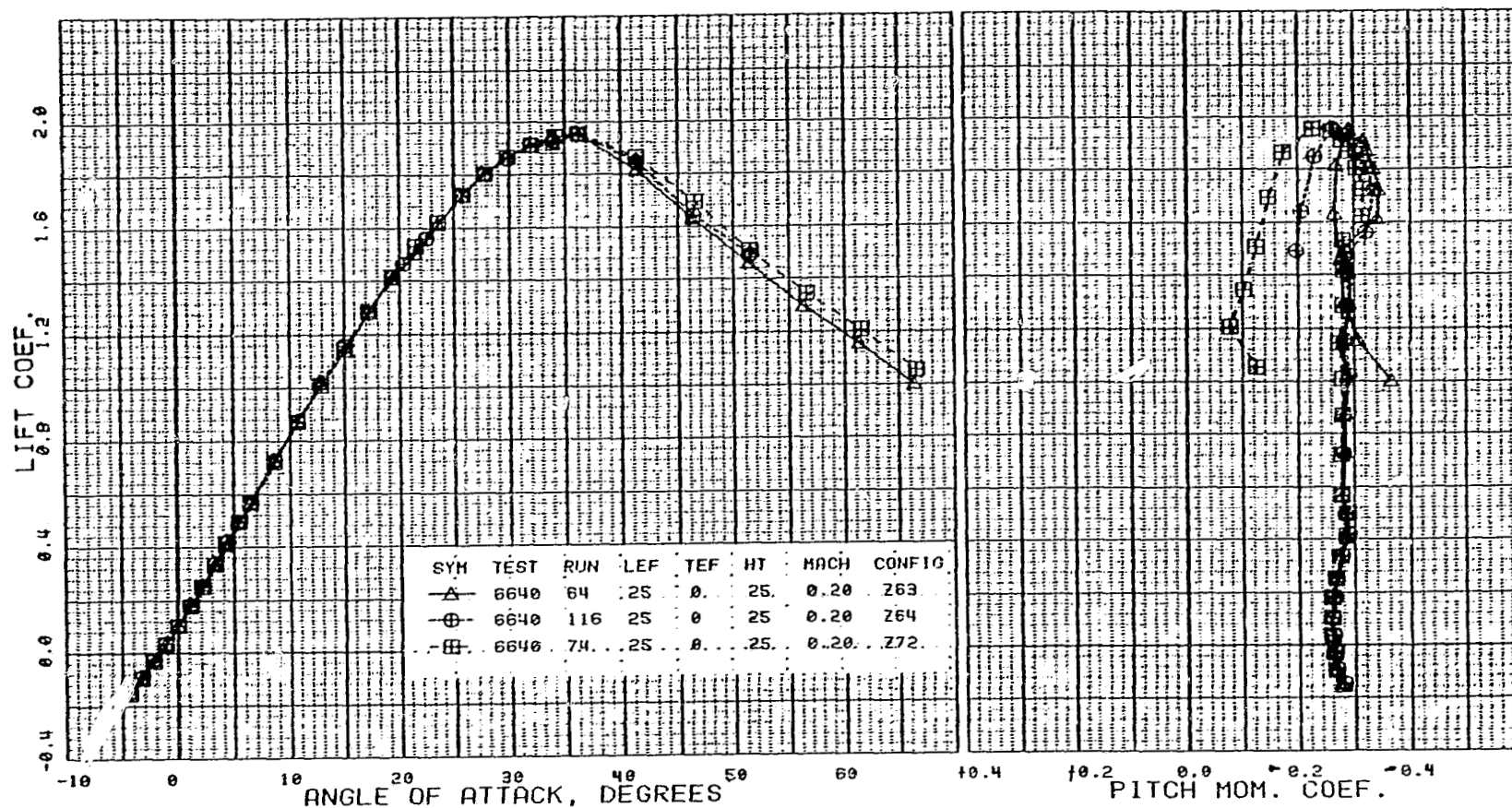


Figure 1-24 Effect of Forebody Strake Forward Extent (Z63, Z64, Z72), kYF-16 + 30.5
Stretch, HT=25°
(a) Lift and Pitching Moment

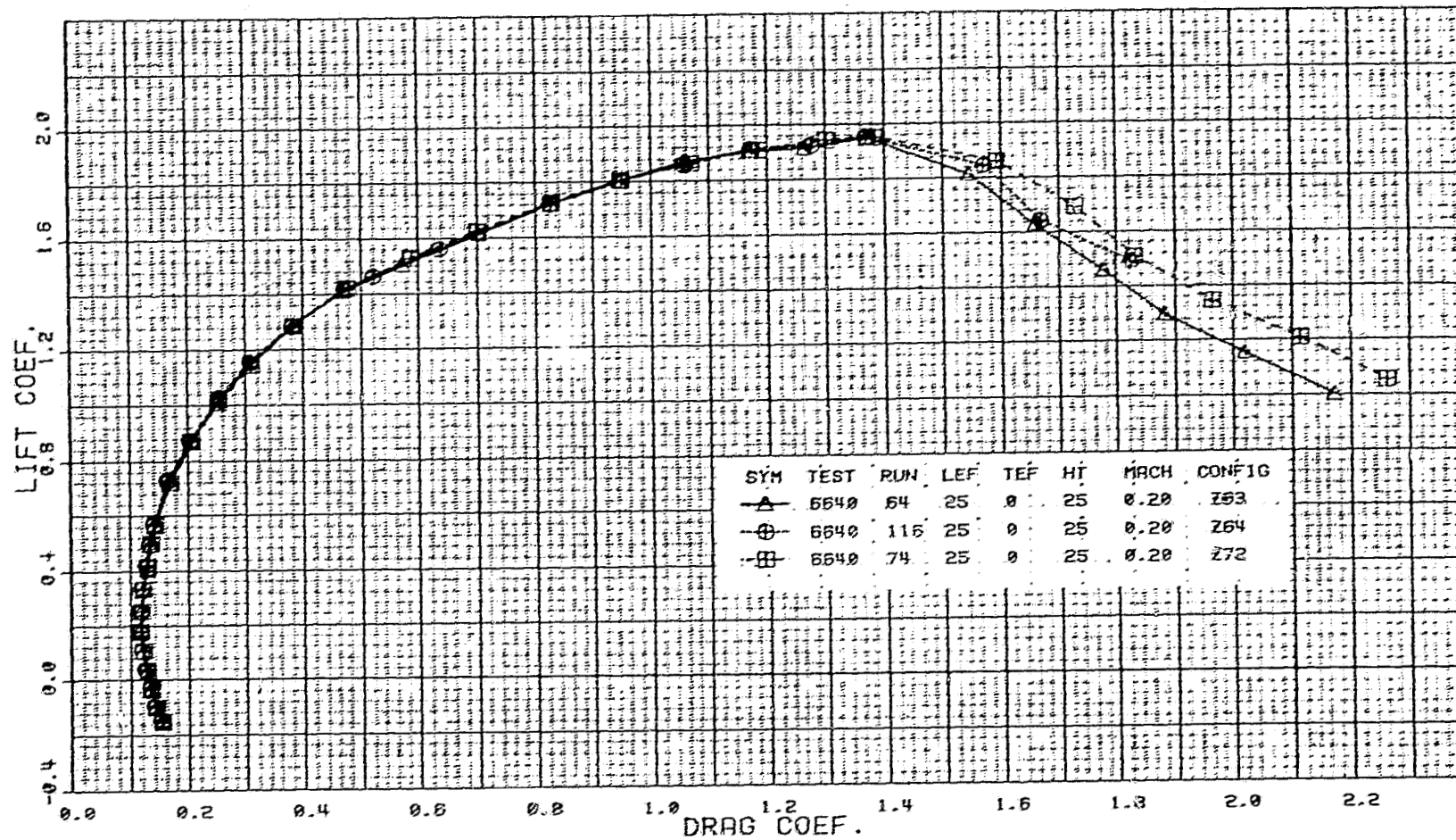


Figure 1-24(b) Drag

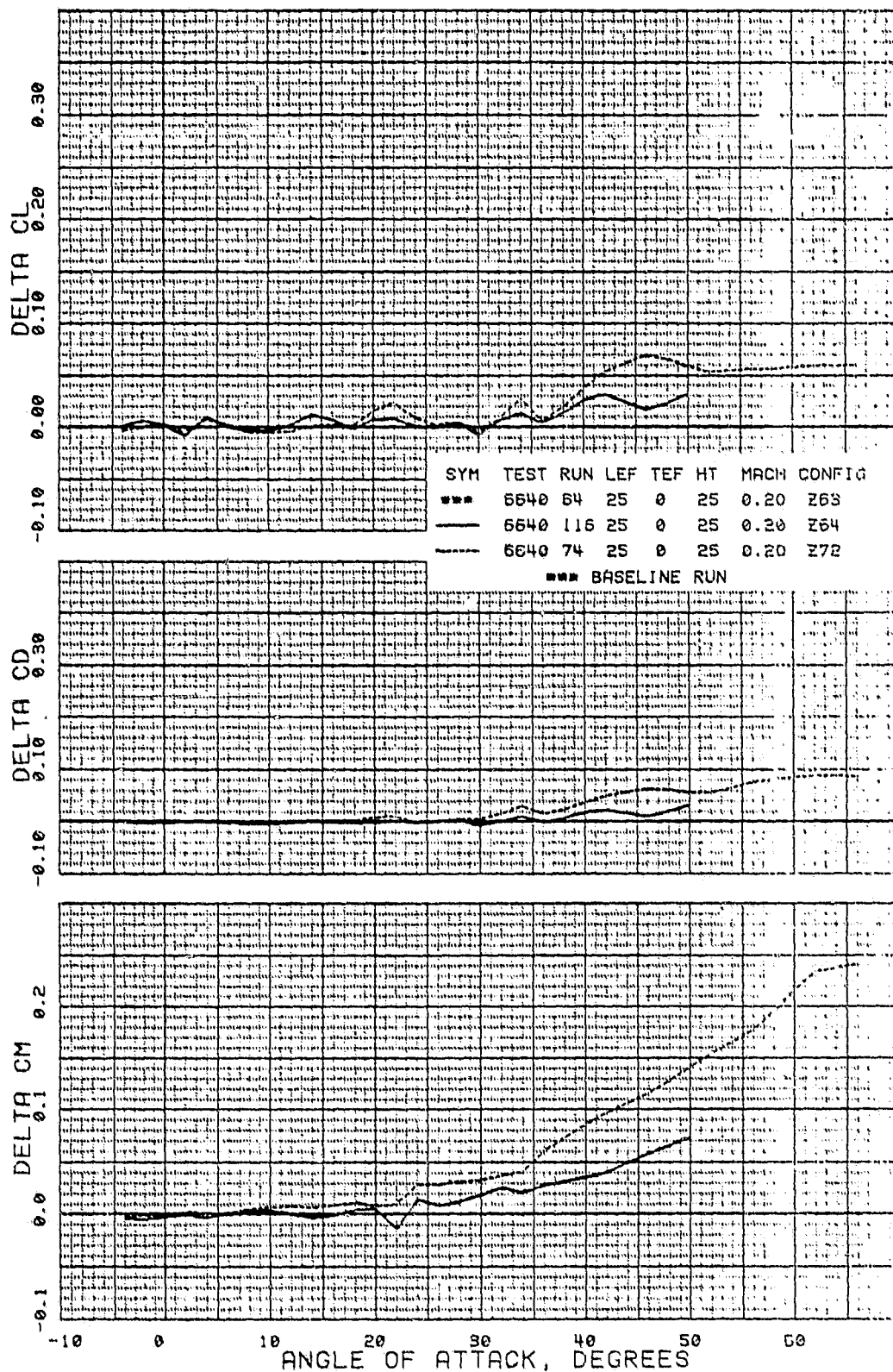


Figure 1-24(c) Increments

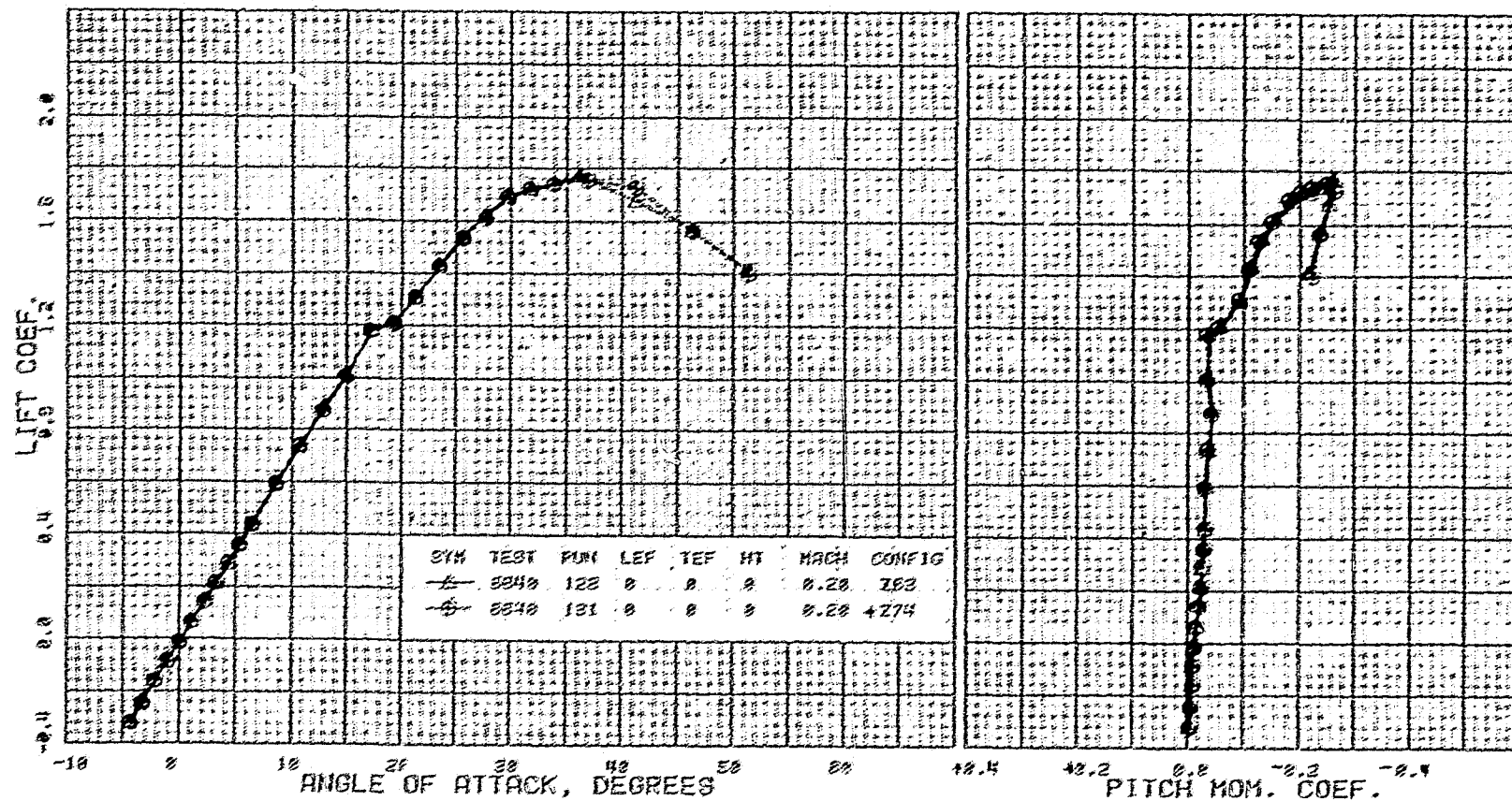


Figure 1-25 Effect of Nose Strake Z74, YF-16 + 30.5 Stretch
(a) Lift and Pitching Moment

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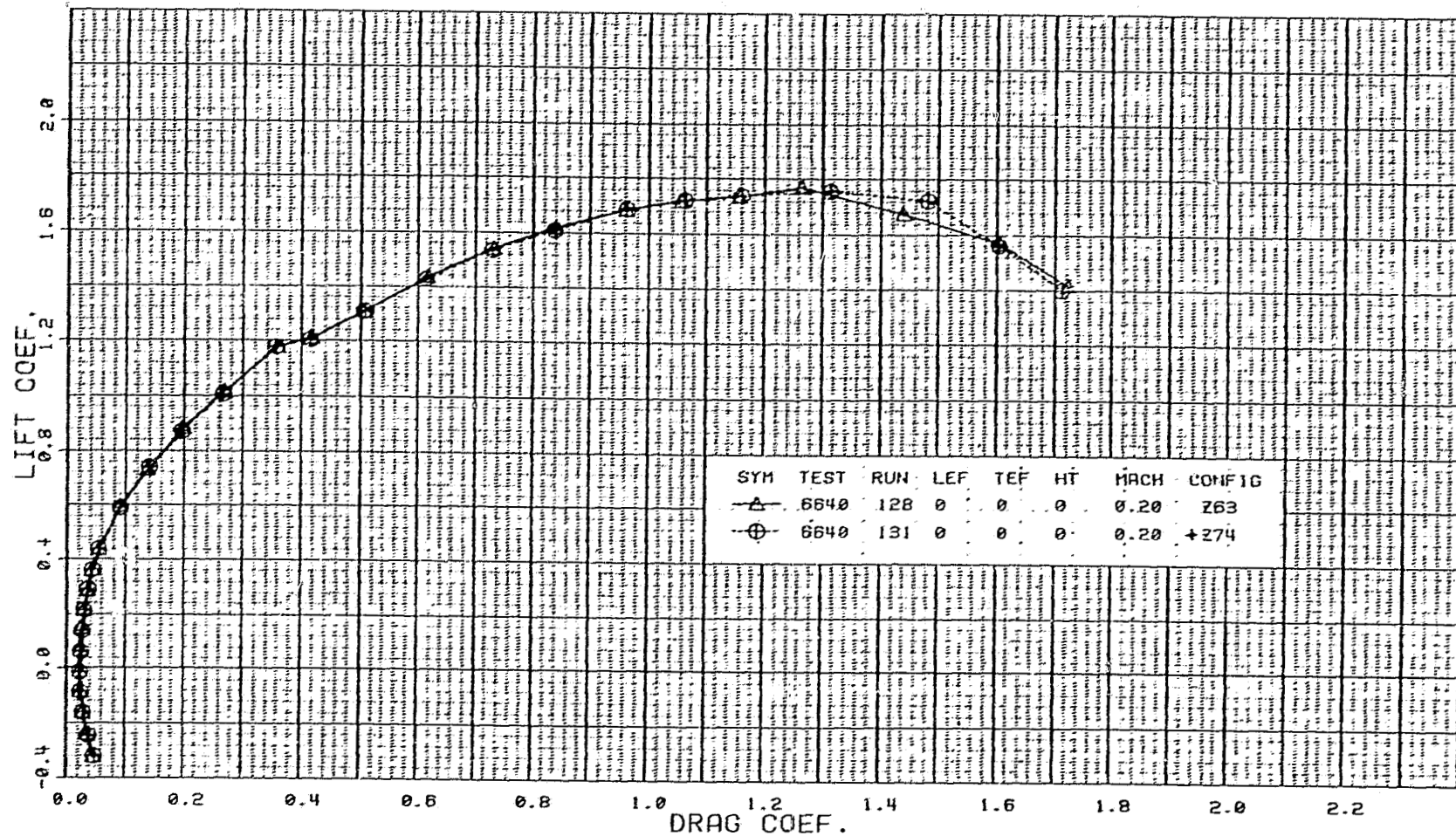


Figure 1-25 (b) Drag

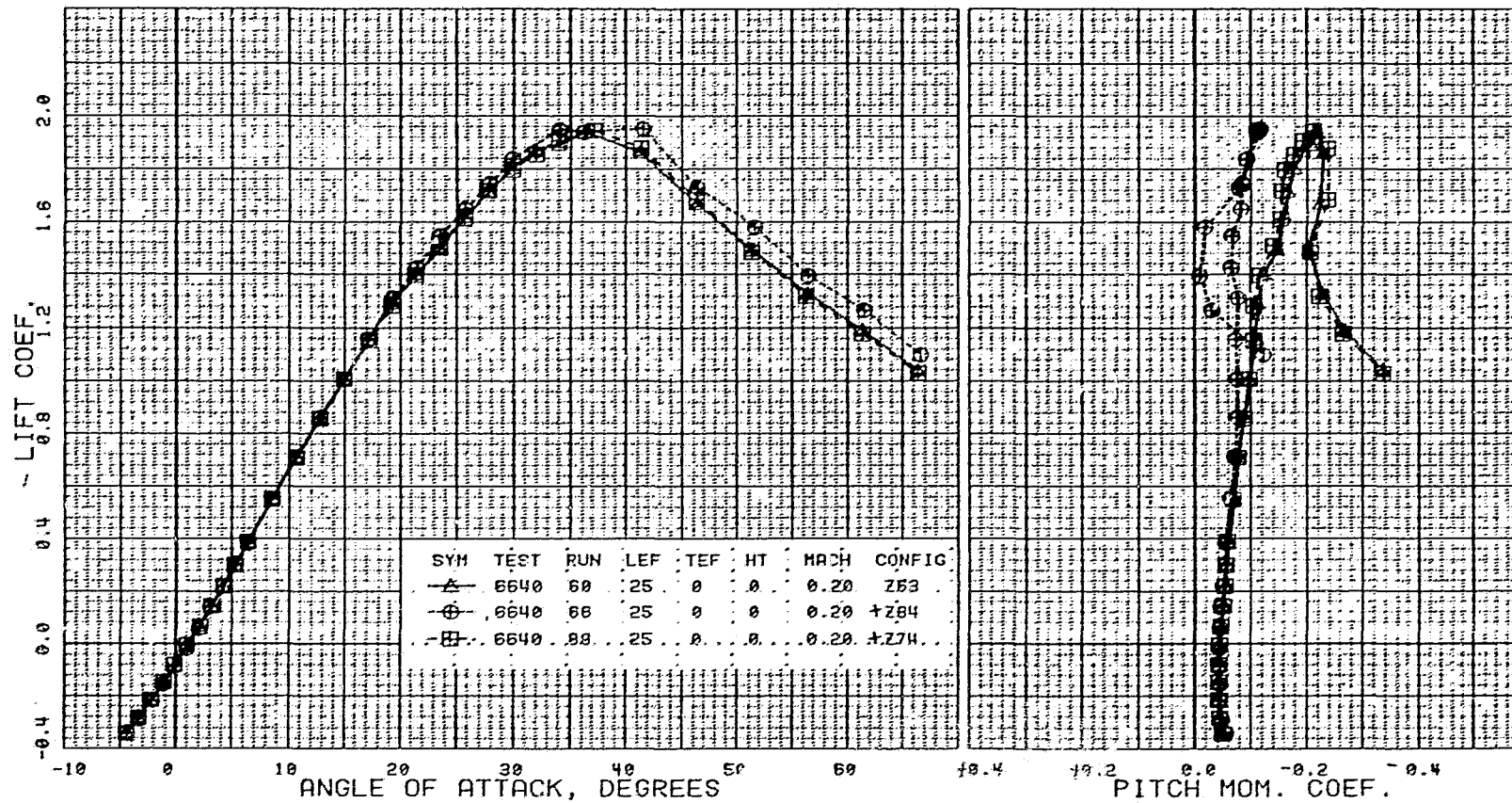


Figure 1-26 Effect of Nose, Z74, and Canard, Z84, Strakes, YF-16 + 30.5 Stretch, HT=0
(a) Lift and Pitching Moment

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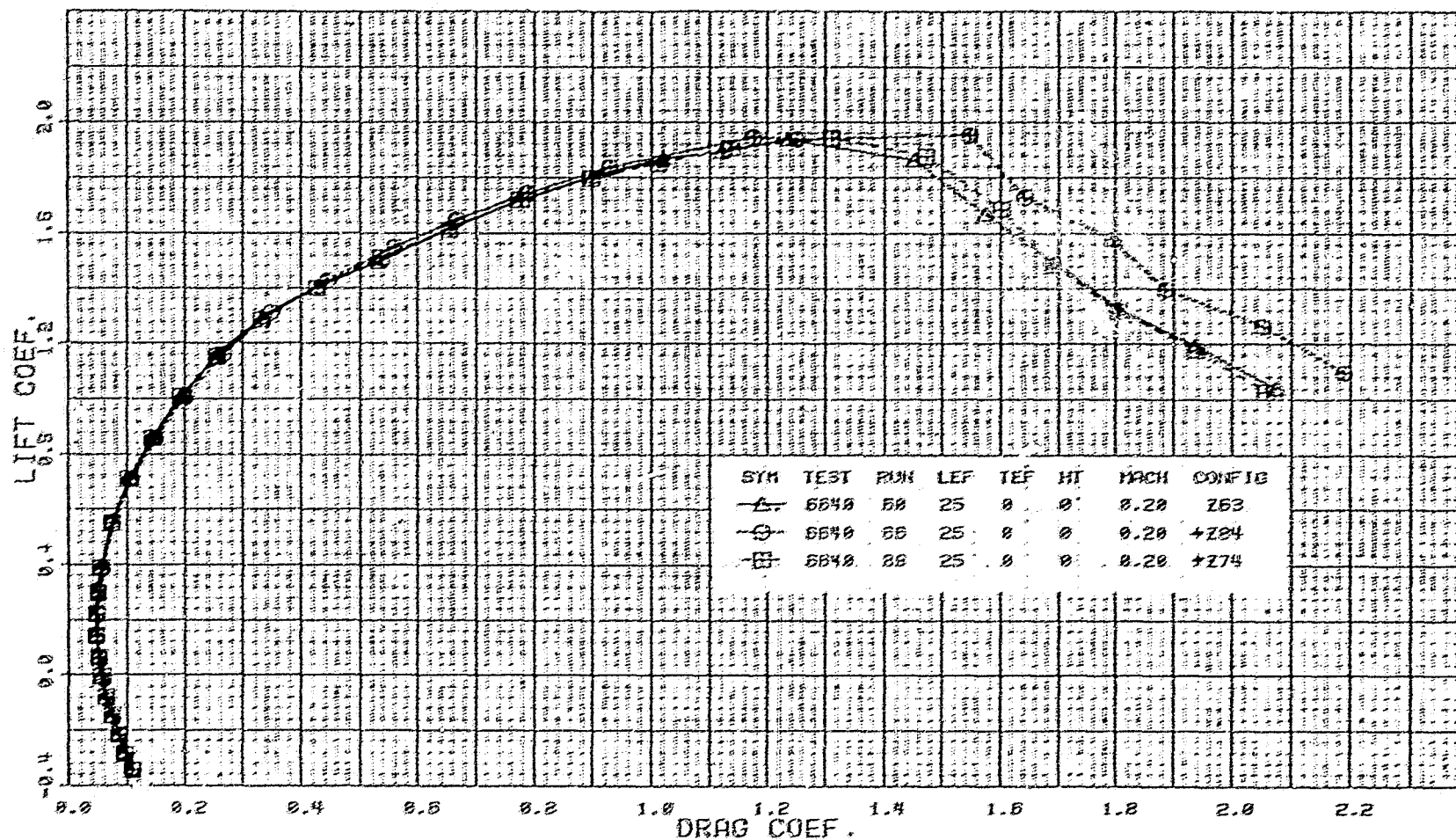


Figure 1-26 (b) Drag

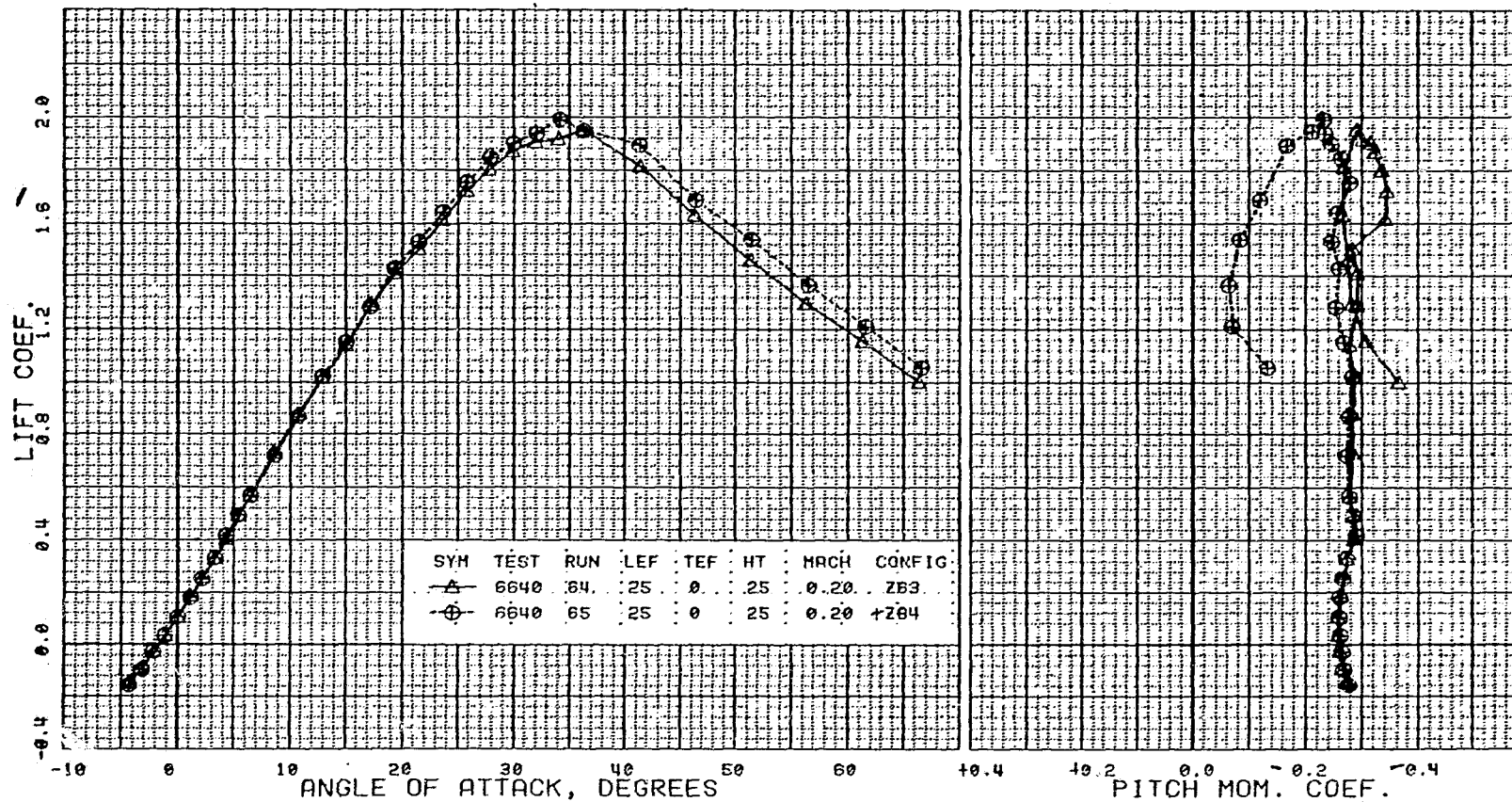


Figure 1-27 Effect of Canard Strake Z84, YF-16 + 30.5
Stretch, HT=25°
(▲) Lift and Pitching Moment

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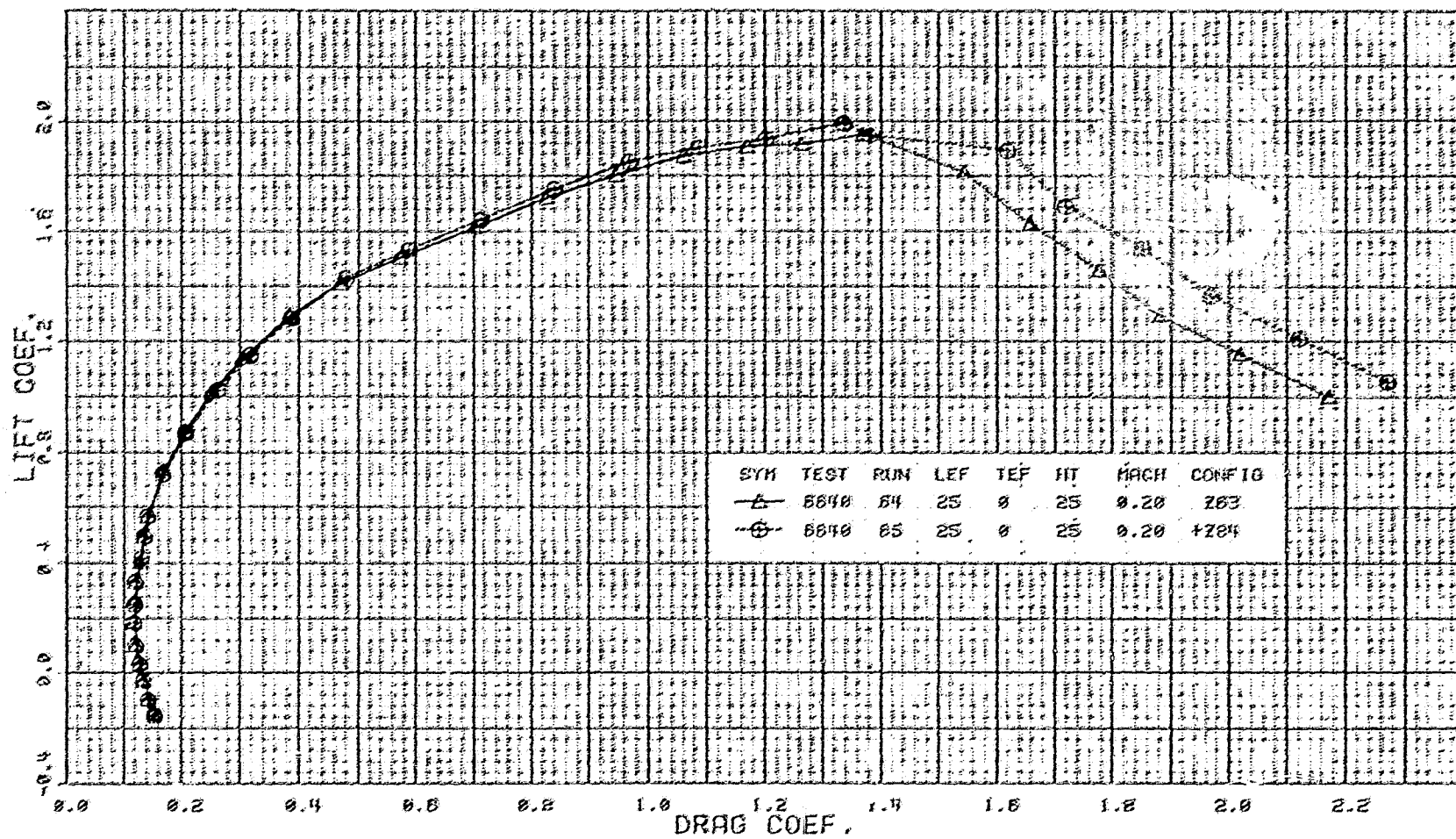


Figure 1-27(b) Drag

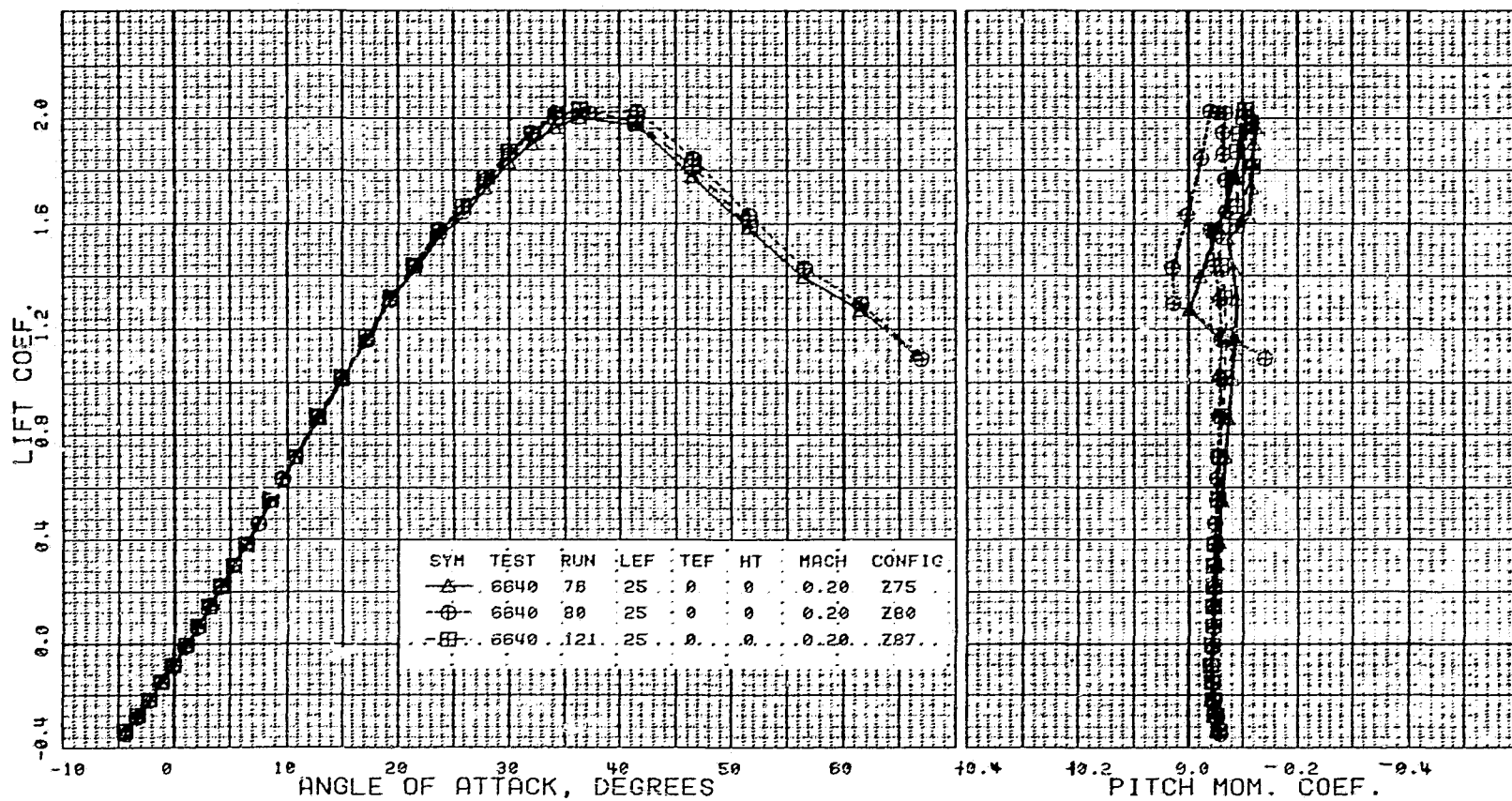


Figure 1-28 Effect of Forebody Strake Shape (Z75, Z80, Z87), YF-16 + 30.5 Stretch, HT=0
(a) Lift and Pitching Moment

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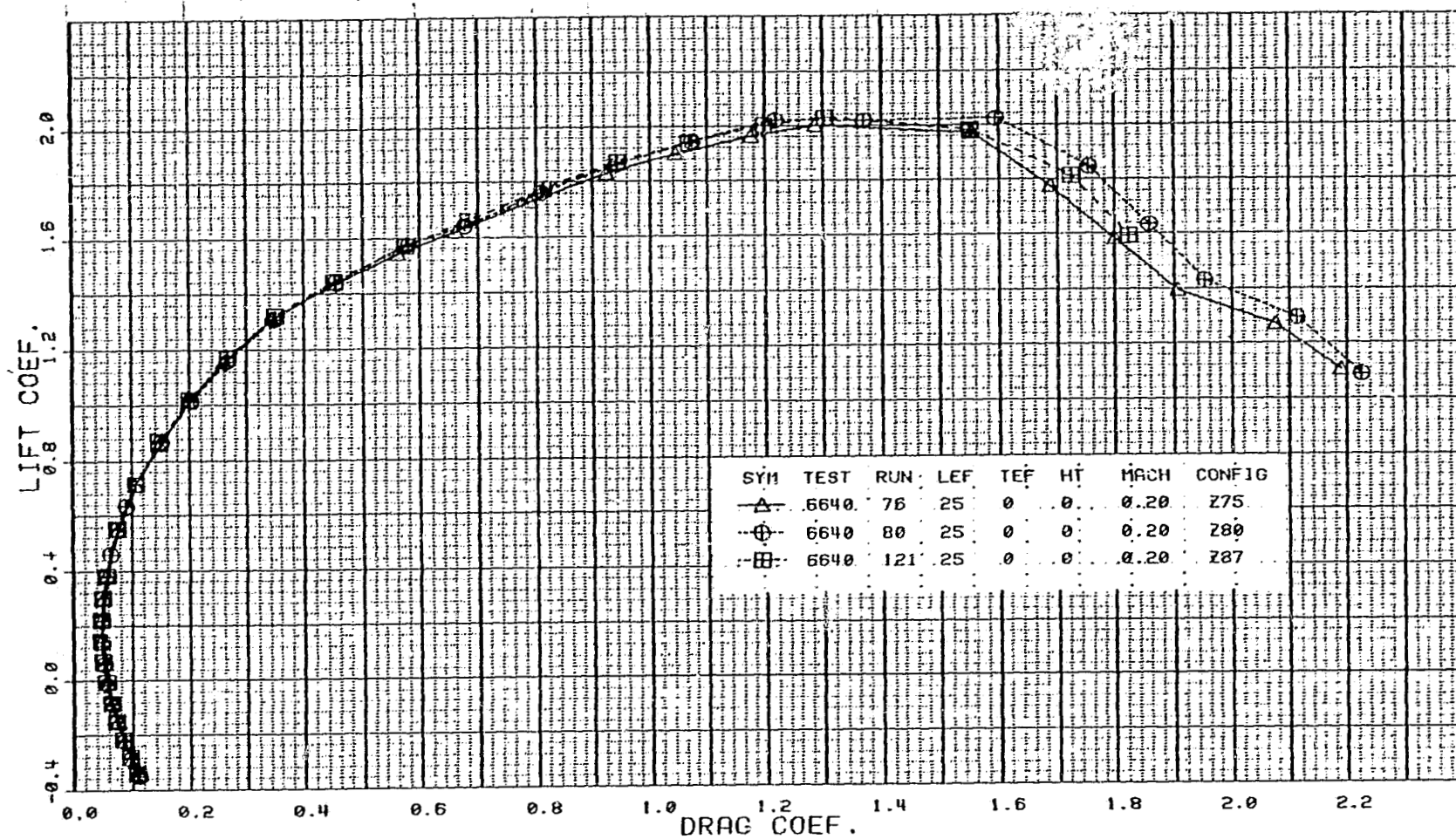


Figure 1-28 (b) Drag

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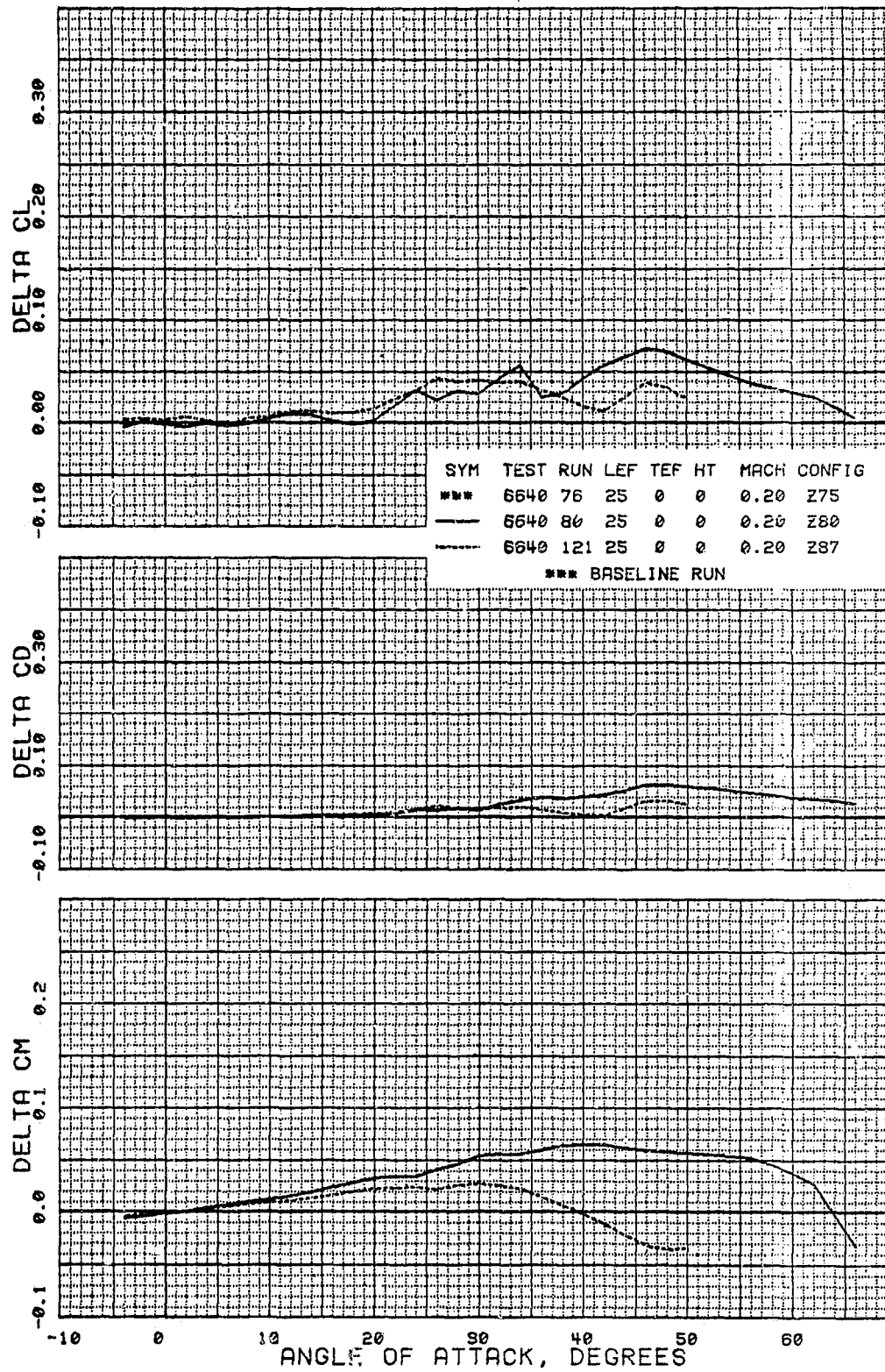


Figure 1-28 (c) Increments

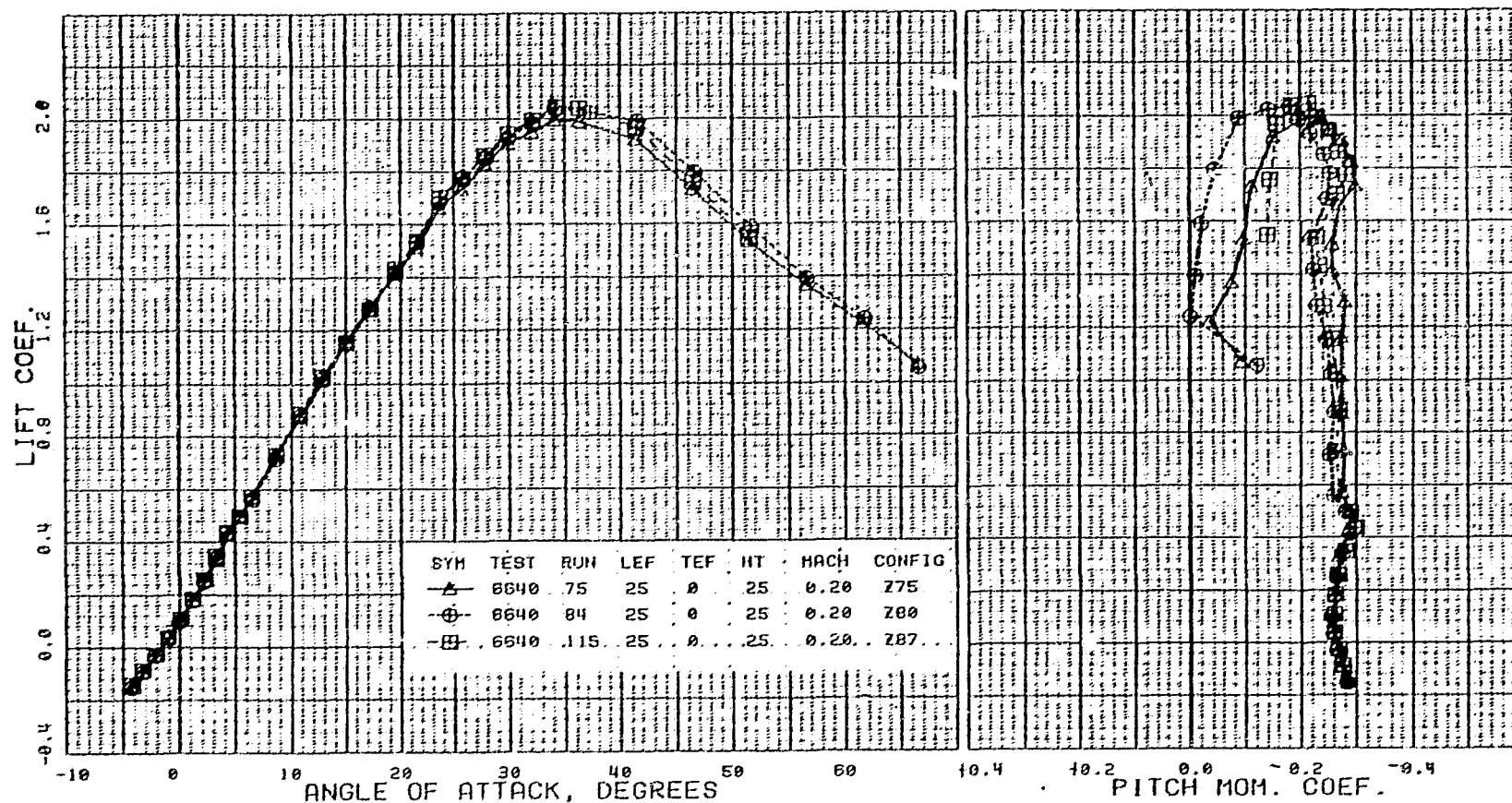


Figure 1-29 Effect of Forebody Strake Shape (Z75, Z80, Z87), YF-16 + 30.5 Stretch, HT=25°
(a) Lift and Pitching Moment

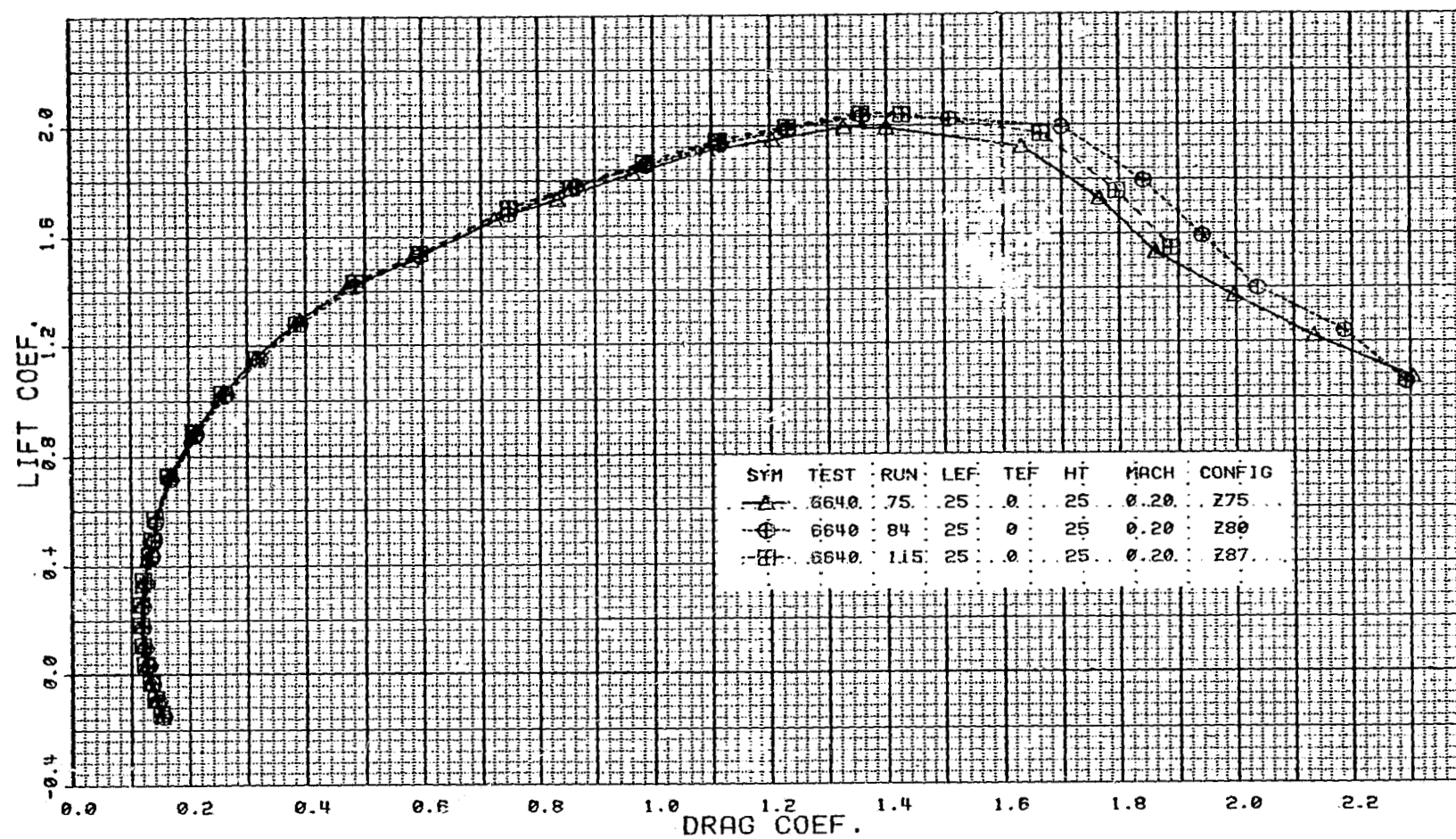


Figure 1-29 (b) Drag.

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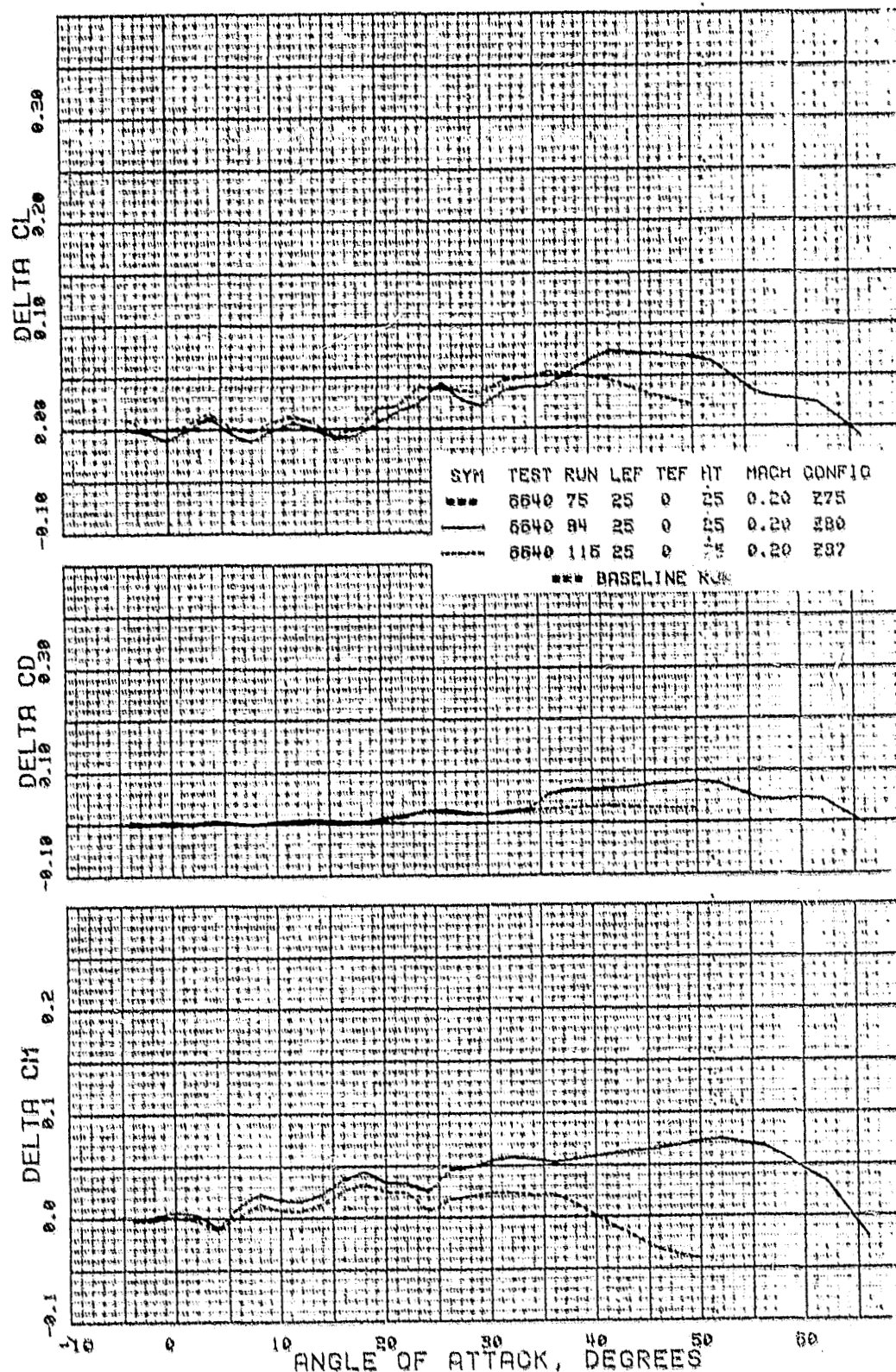


Figure 1-29 (c) Increments

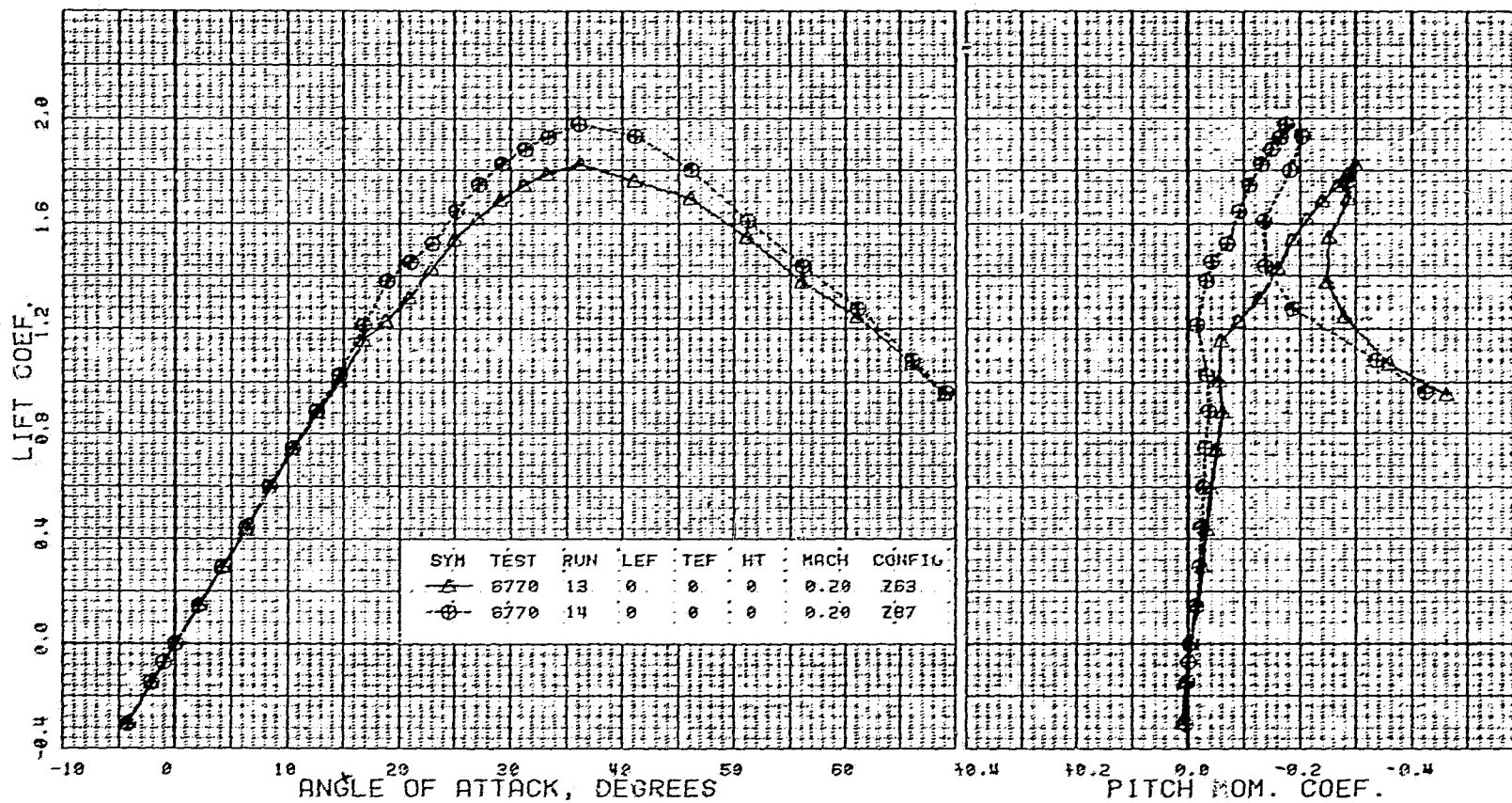


Figure 1-30 Effect of Forebody Strake Z87, YF-16 + 30.5 Stretch
(a) Lift and Pitching Moment

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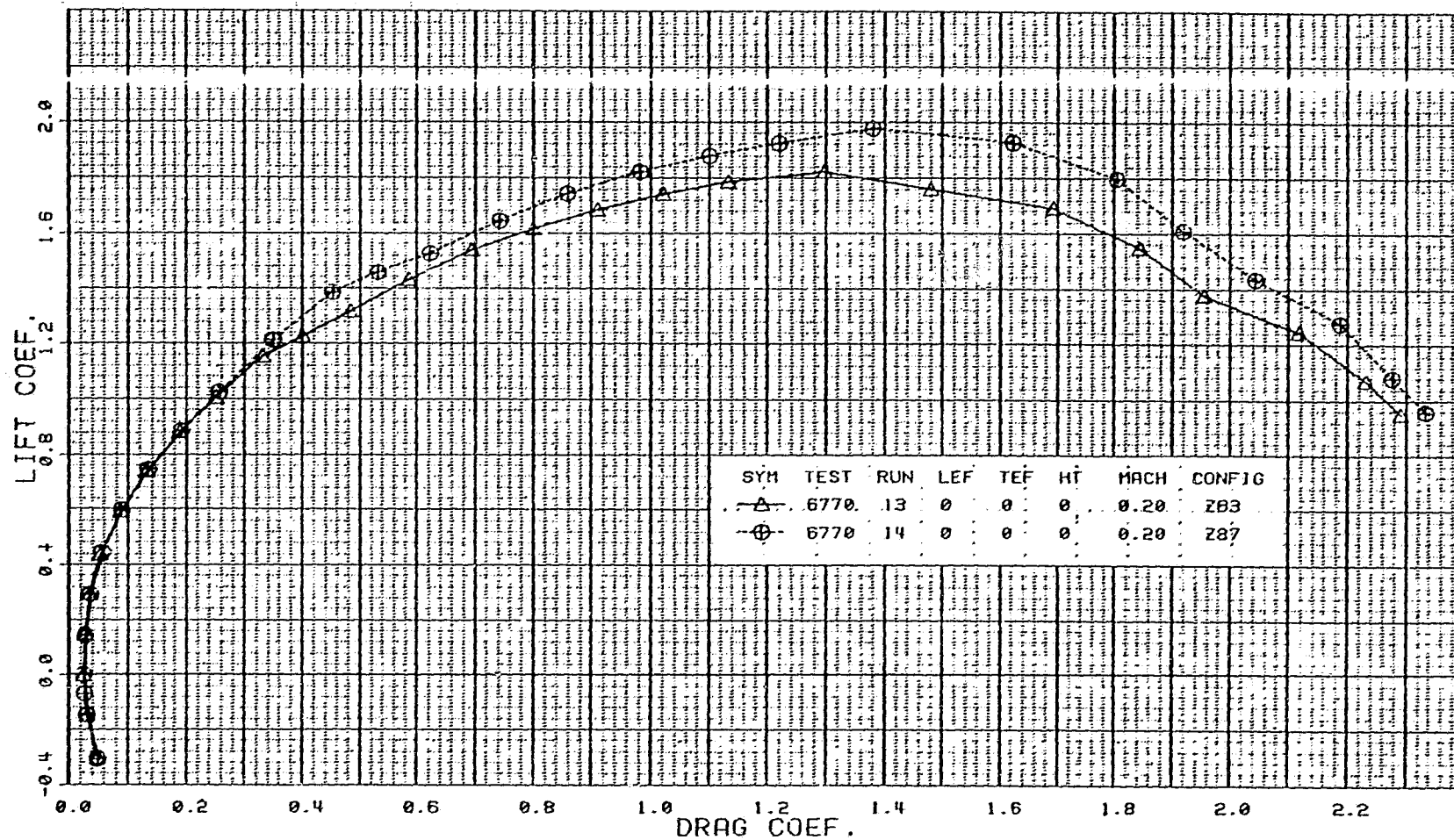


Figure 1-30 (b) Drag

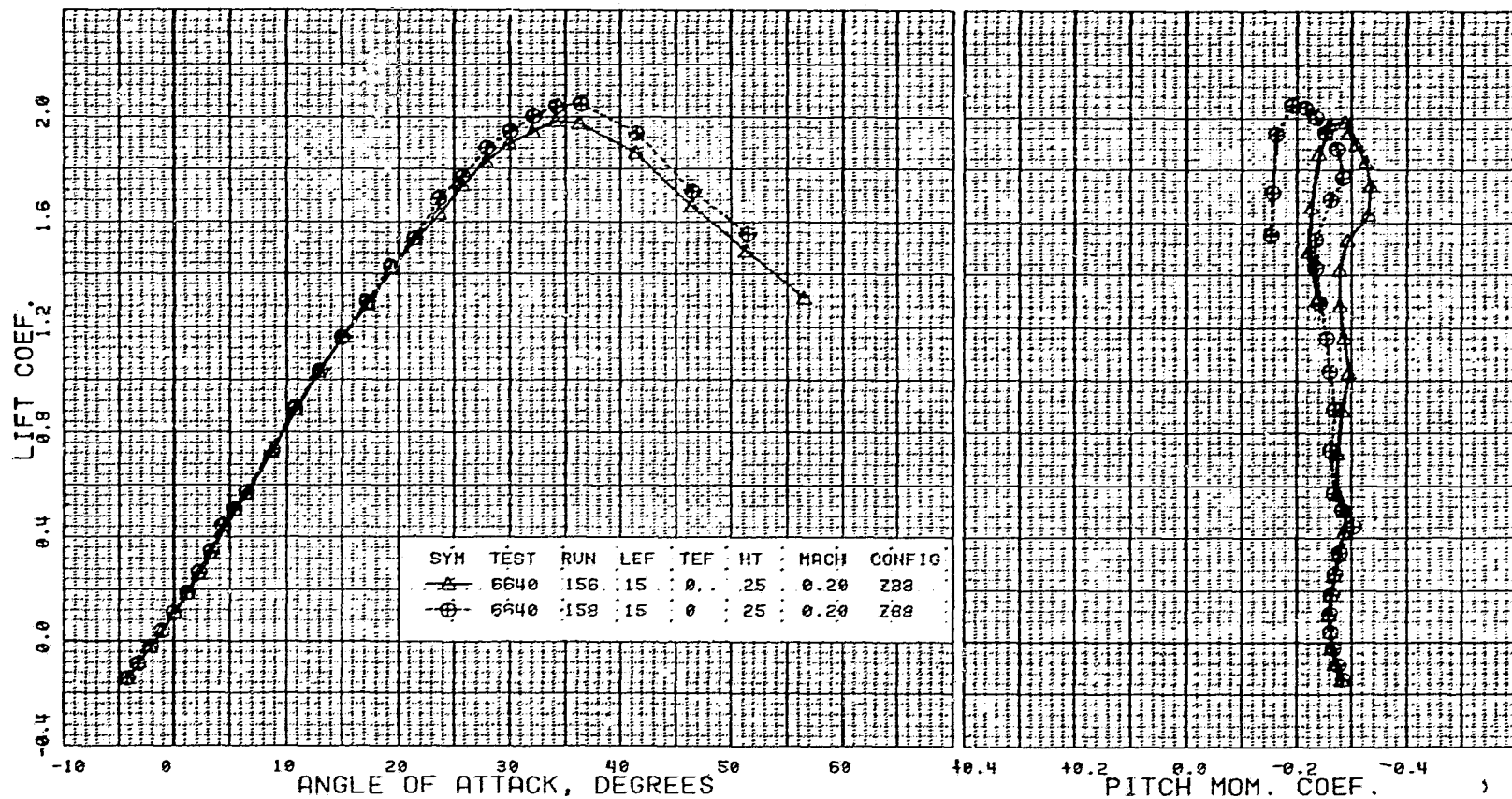


Figure 1-31 Effect of Forebody Strake Shape (Z88 and Z89), YF-16 + 30.5 Stretch
(a) Lift and Pitching Moment

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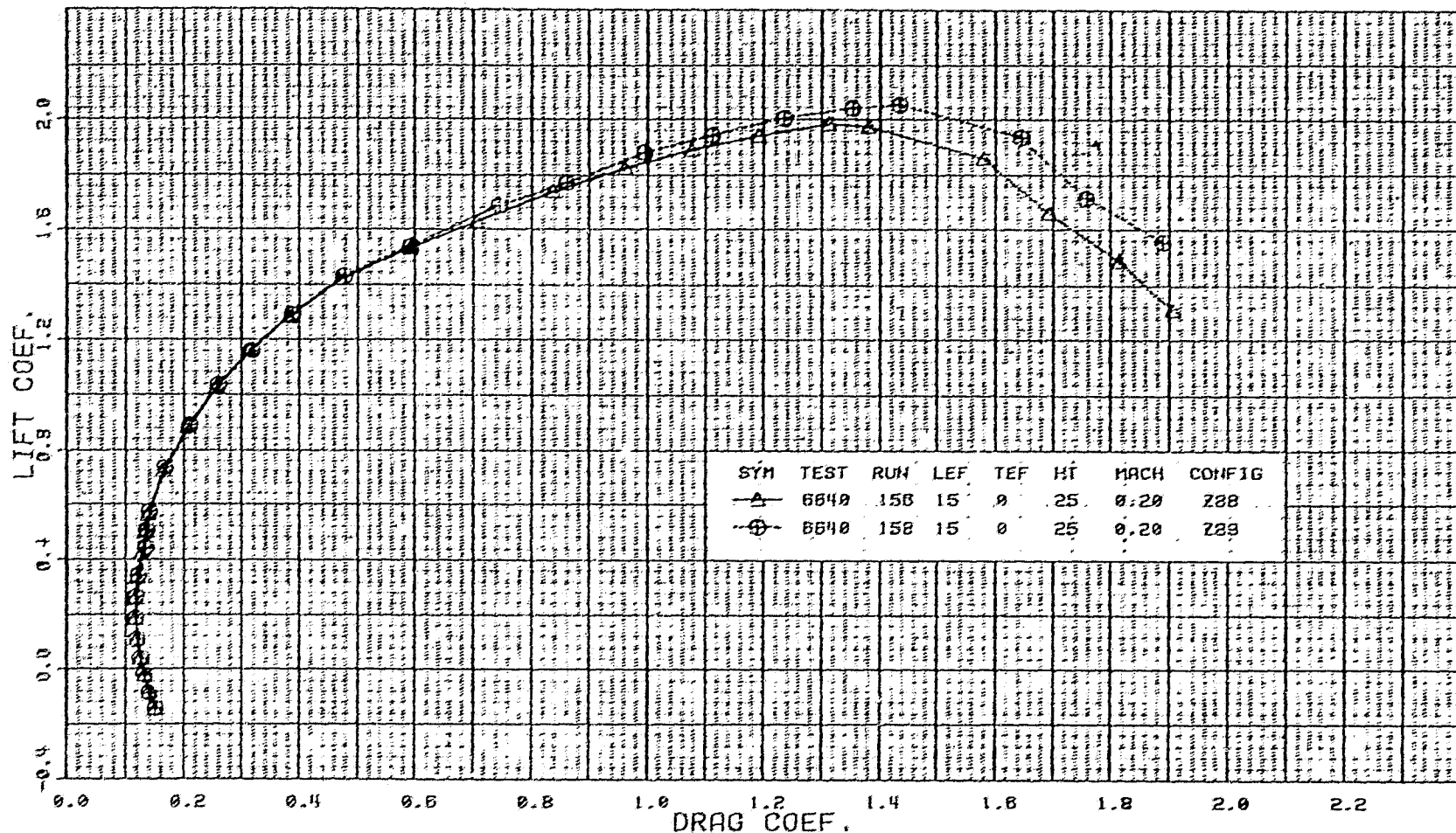


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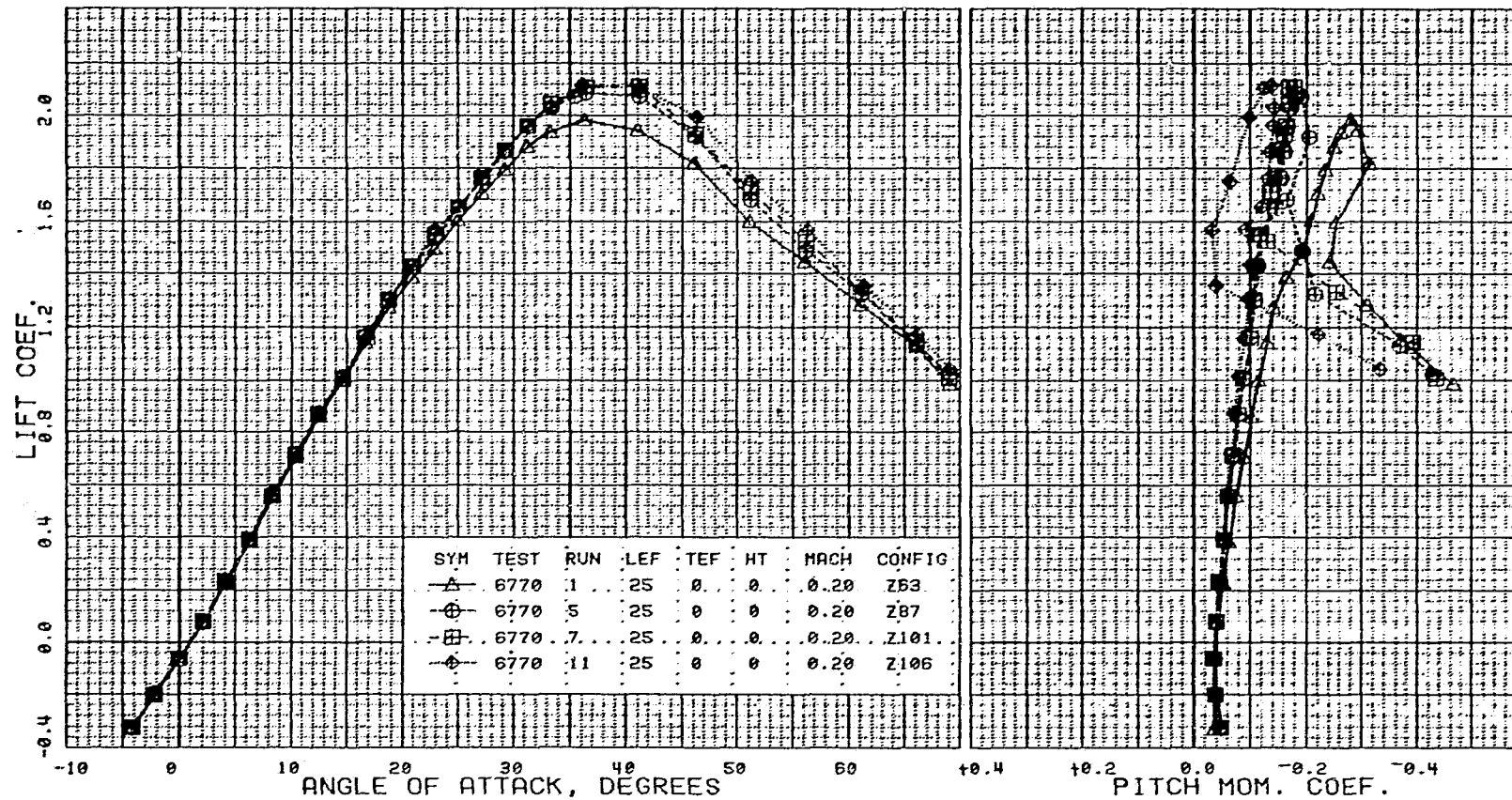


Figure 1-32 Effect of Forebody Strake Forward Extent (Z63, Z87, Z101, Z106), YF-16 + 30.5 Stretch, HT=0
(a) Lift and Pitching Moment

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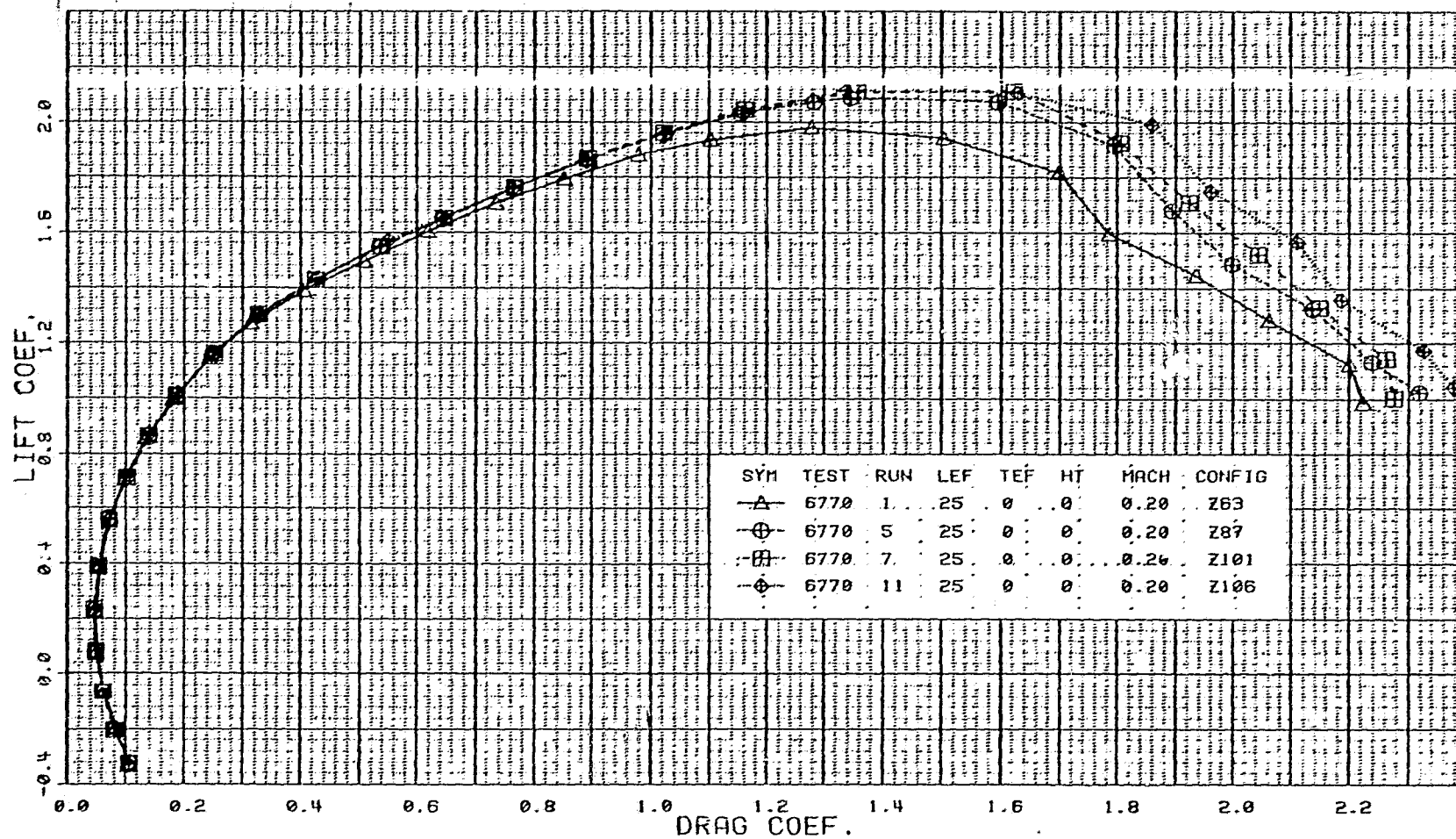


Figure 1-32 (b) Drag

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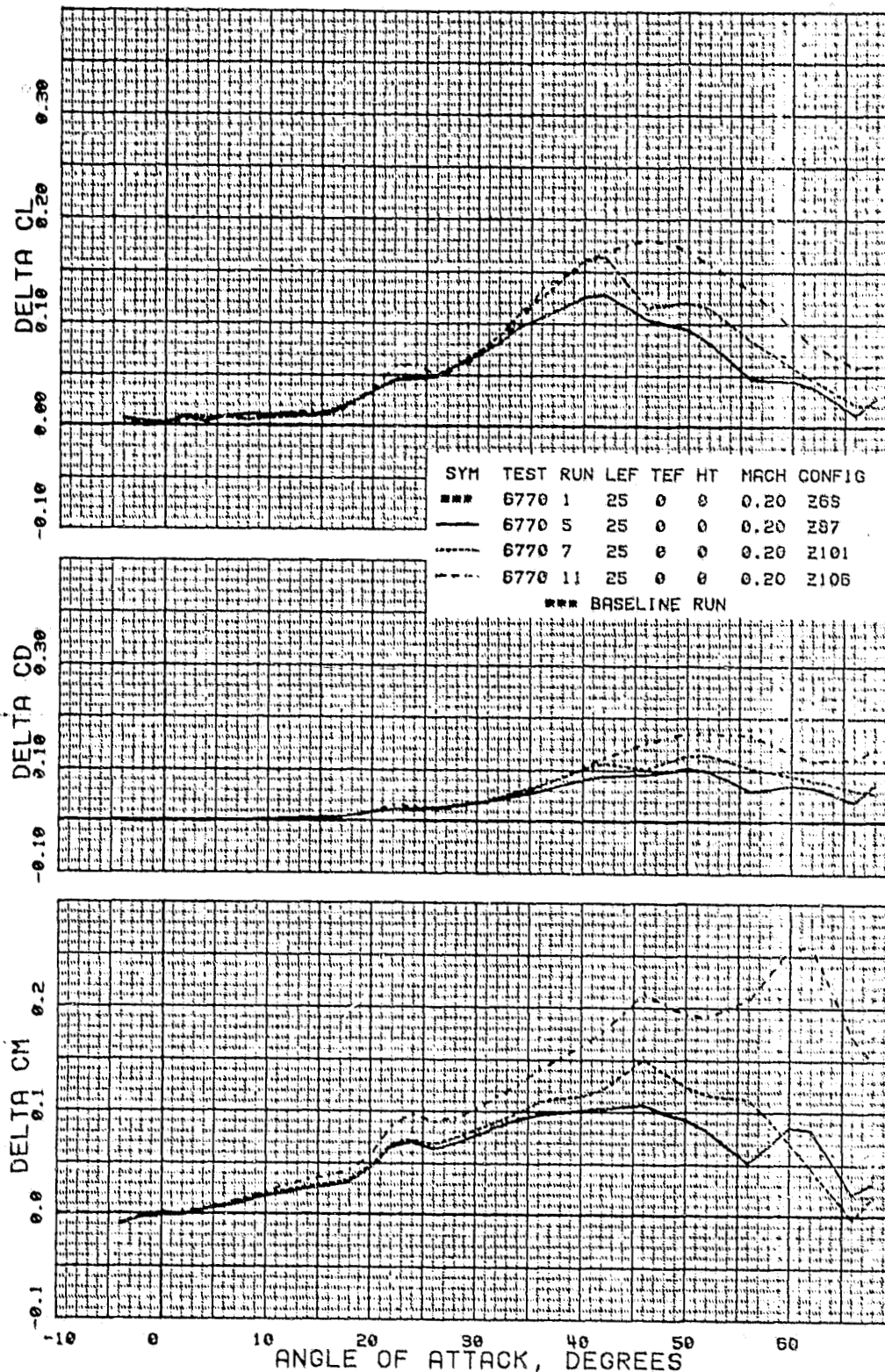


Figure 1-32 (c) Increments

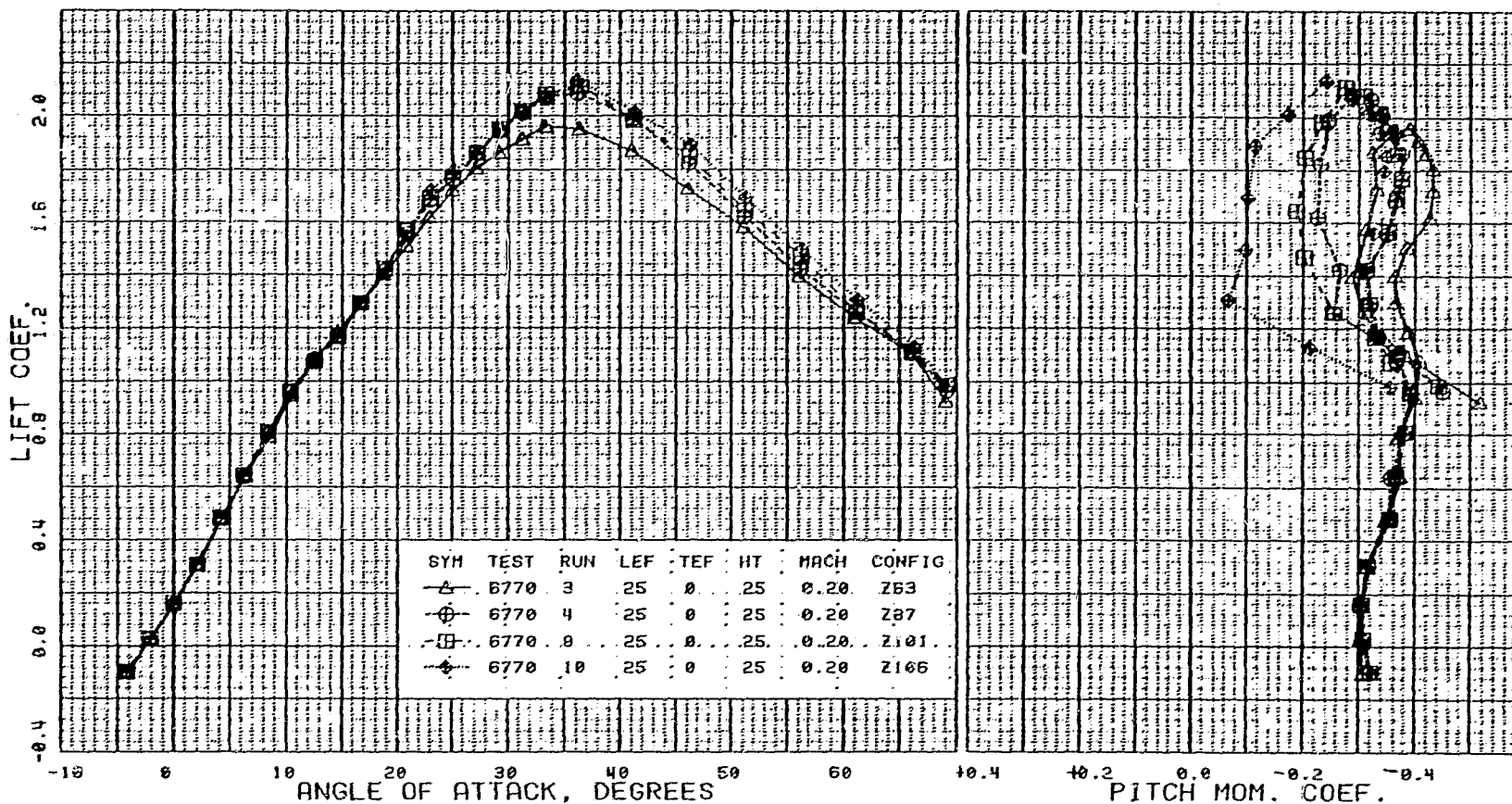
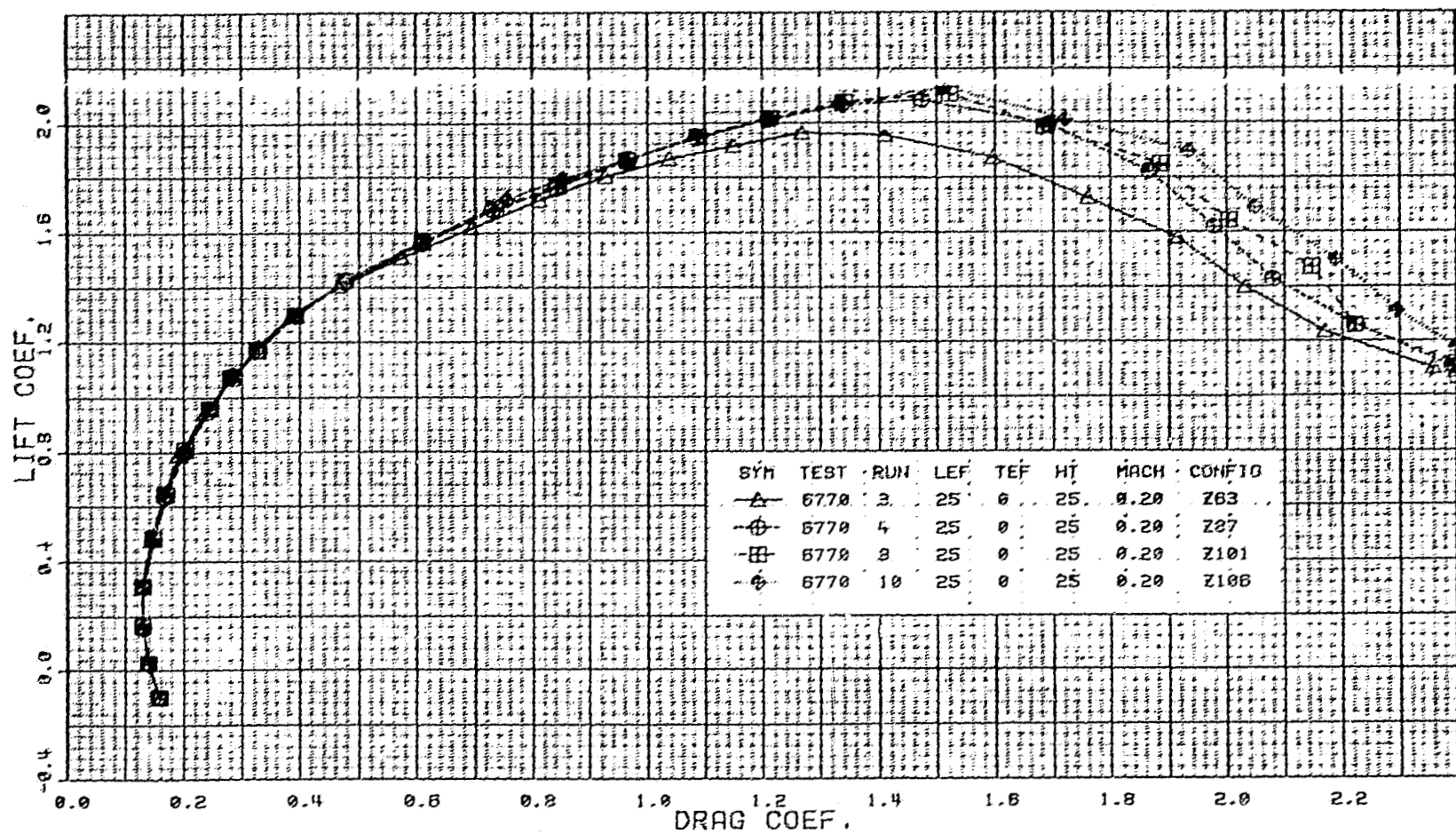


Figure 1-33 Effect of Forebody Strake Forward Extent (Z63, Z87, Z101, Z106), YF-16 + 30.5 Stretch, HT=25°
(a) Lift and Pitching Moment



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Figure 1-33 (b) Drag

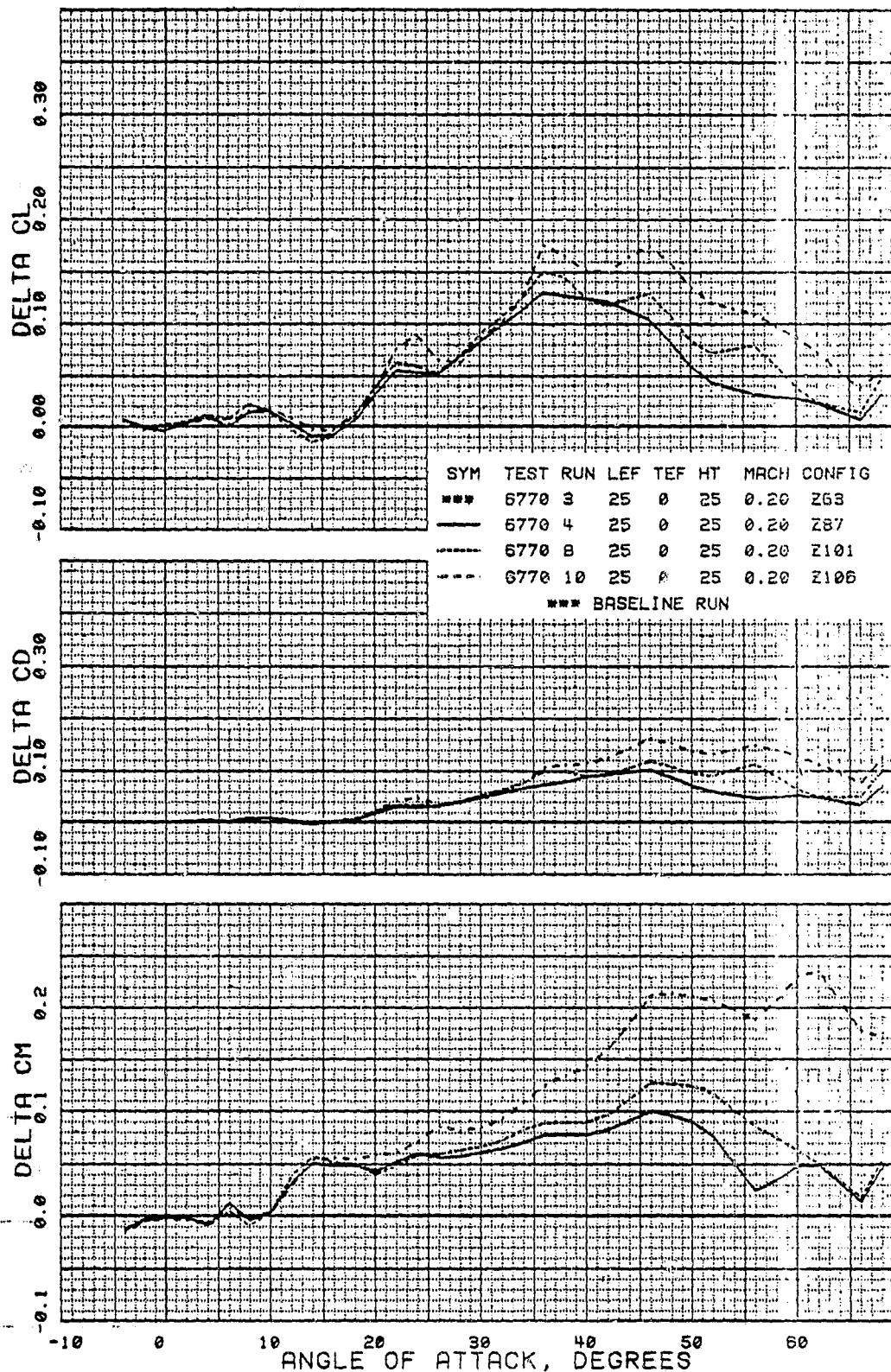


Figure 1-33 (c) Increments

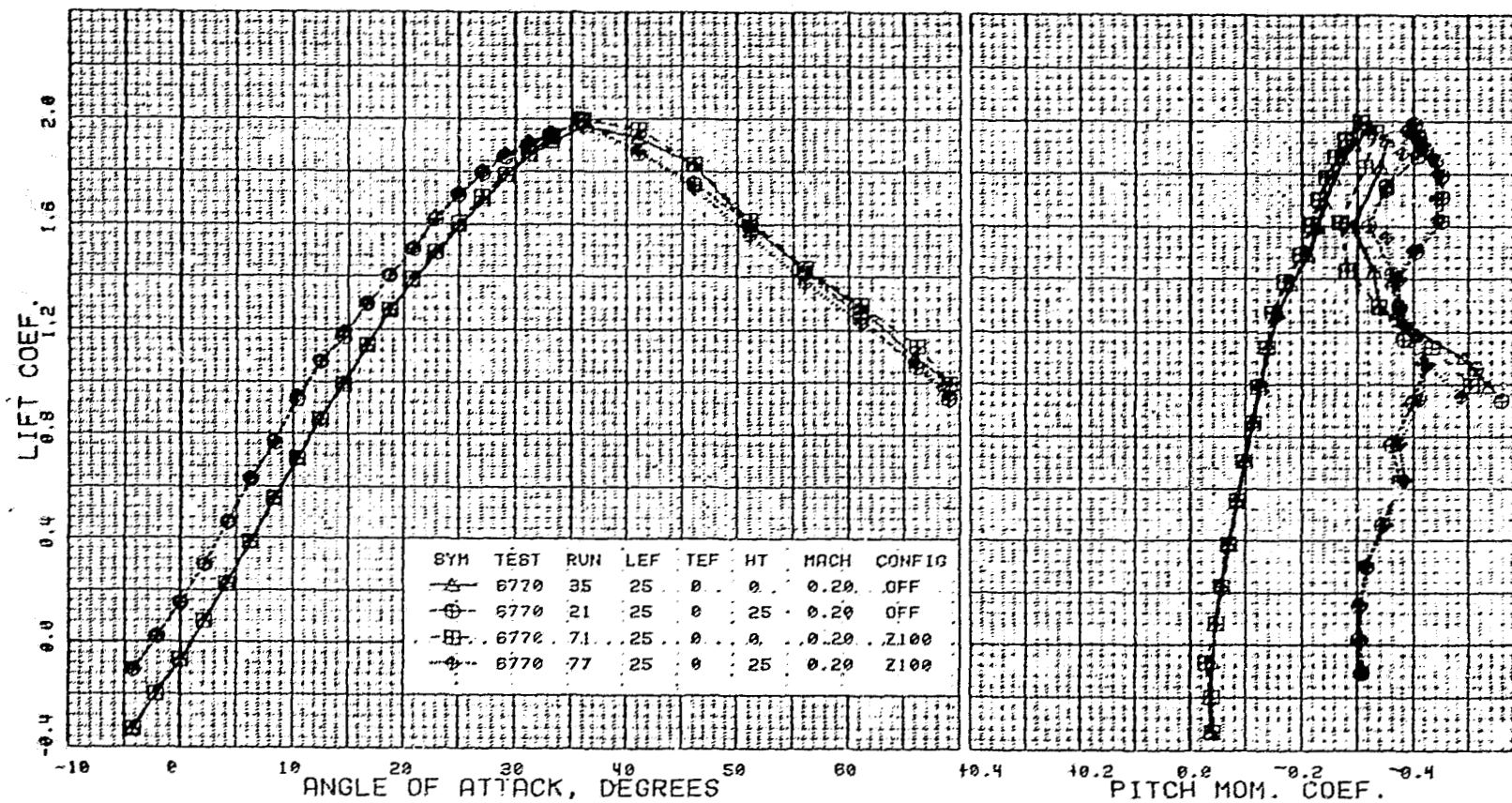


Figure 1-34 Effect of Nose Strake Z100, YF-16
(a) Lift and Pitching Moment

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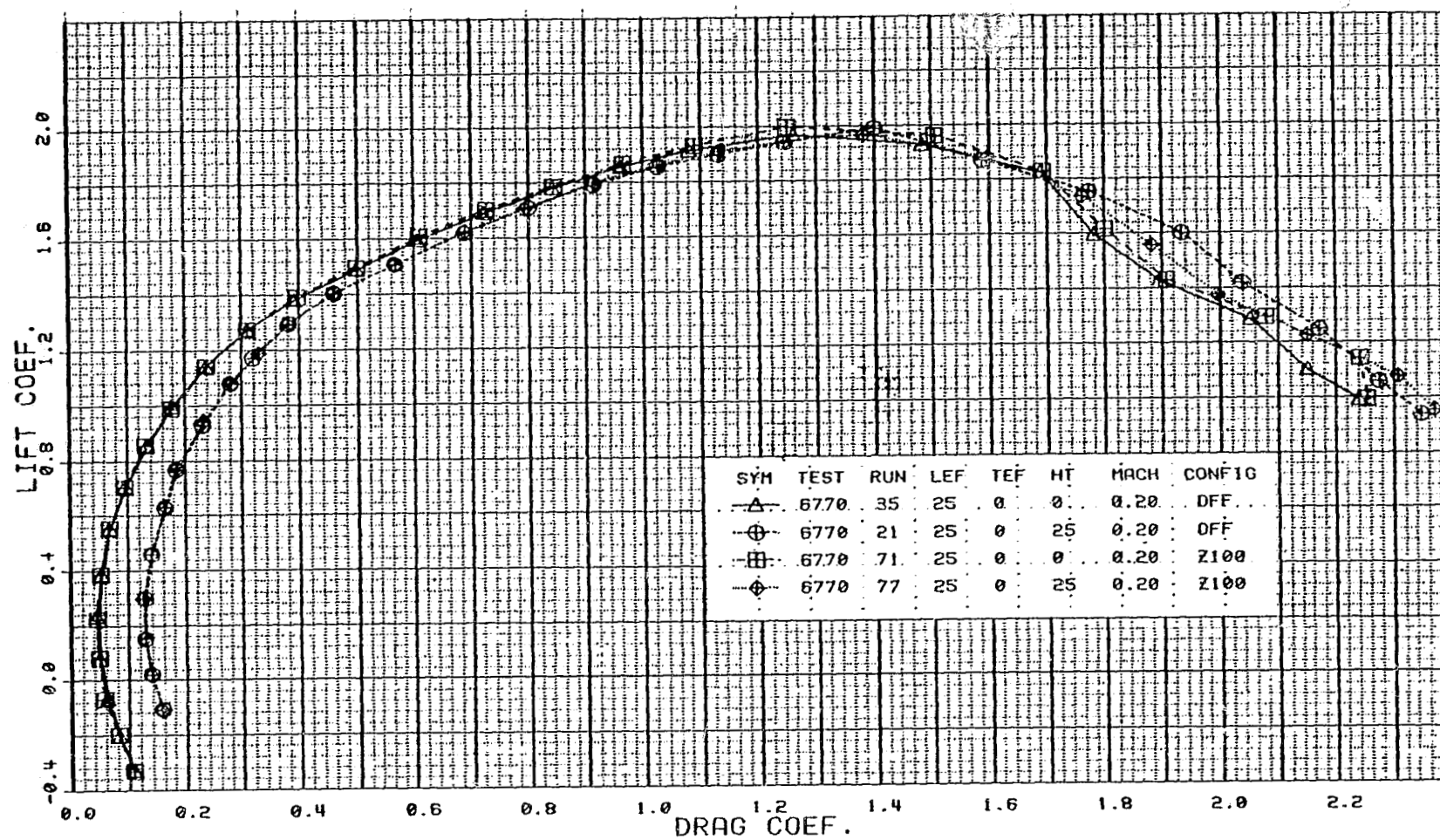


Figure 1-34 (b) Drag

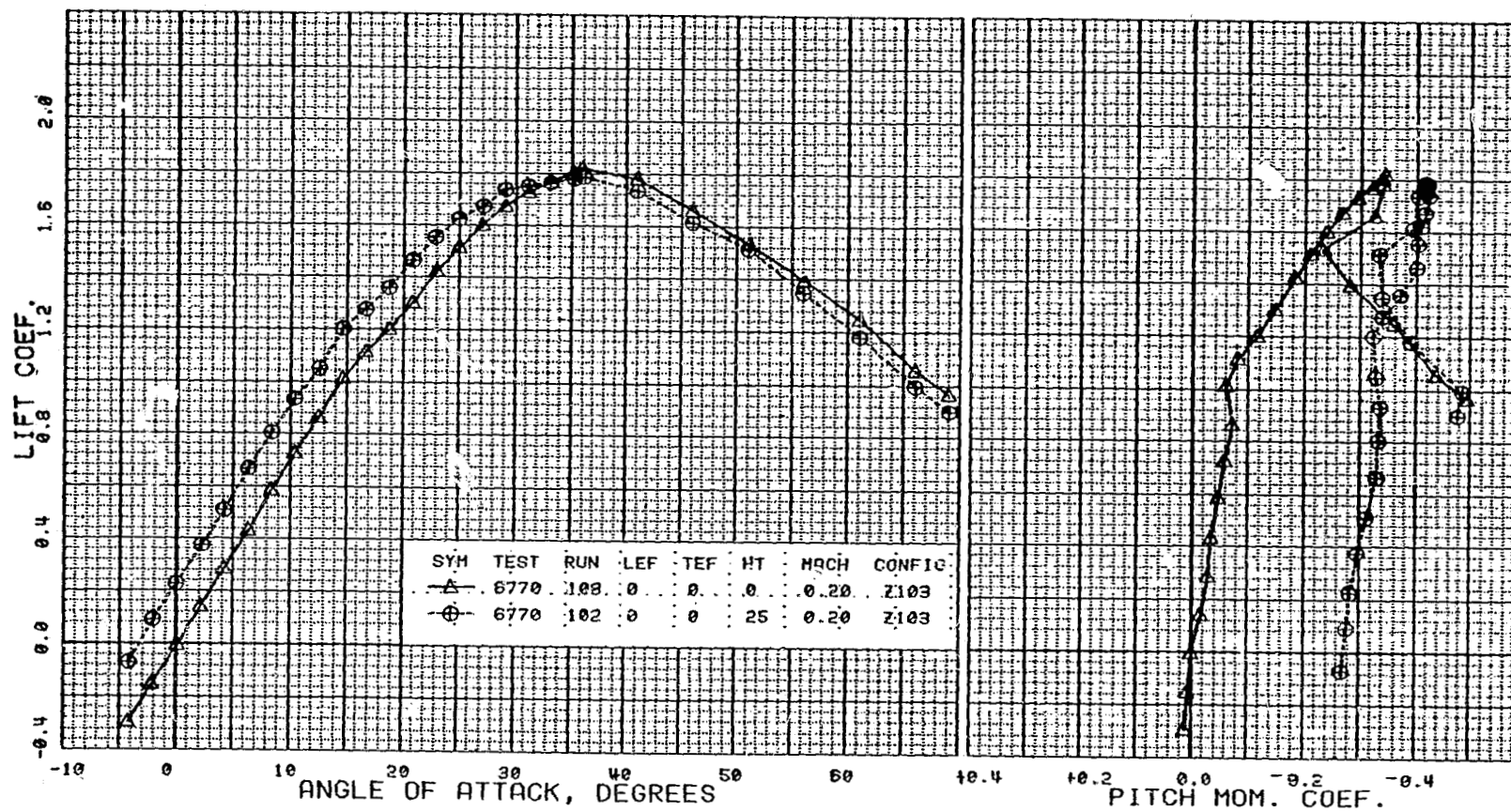


Figure 1-35 Effect of Horizontal Tail Deflection with Strake.
Z103, F-16 with Wing W3BB
(a) Lift and Pitching Moment

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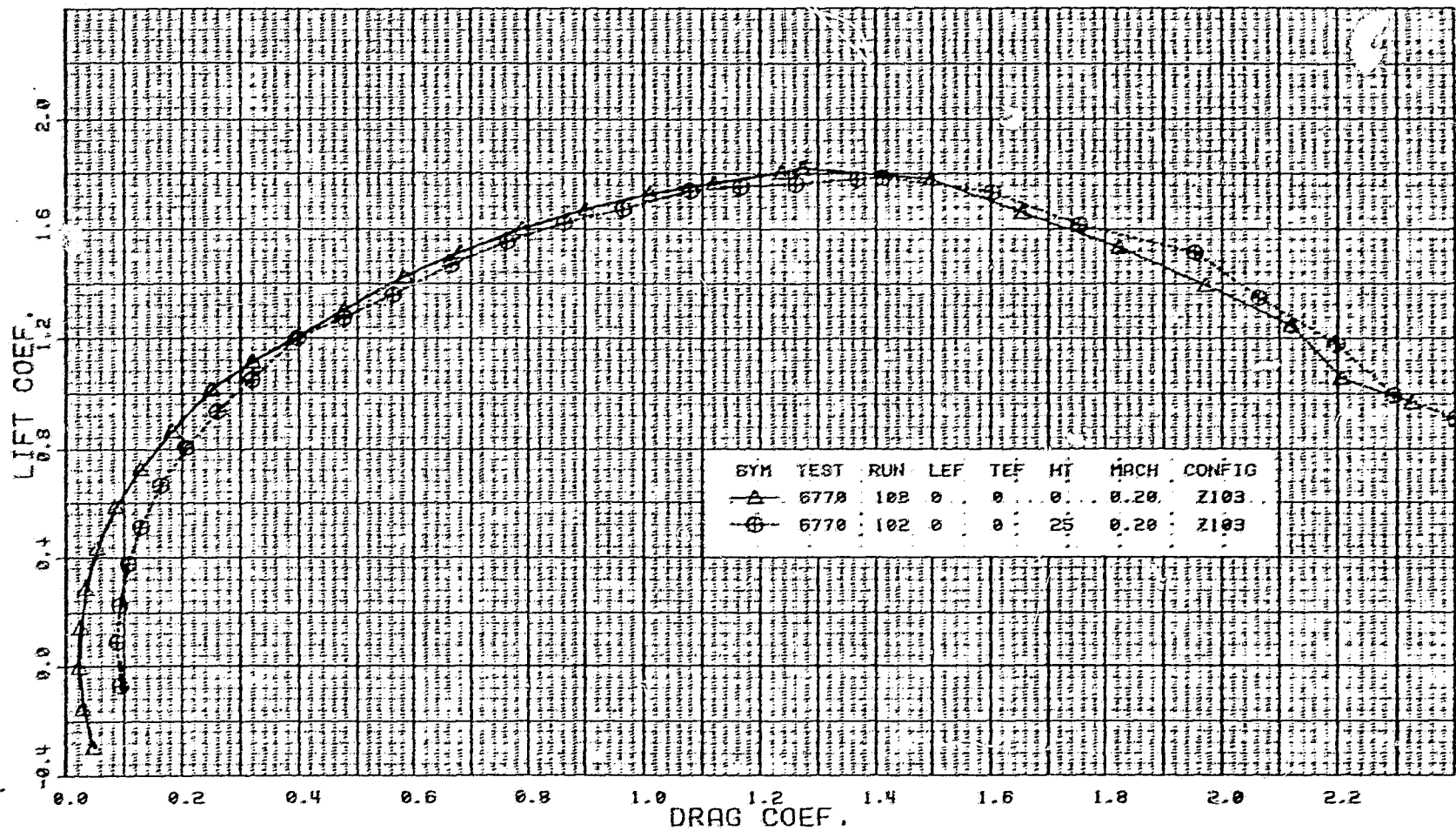


Figure 1-35 (b) Drag

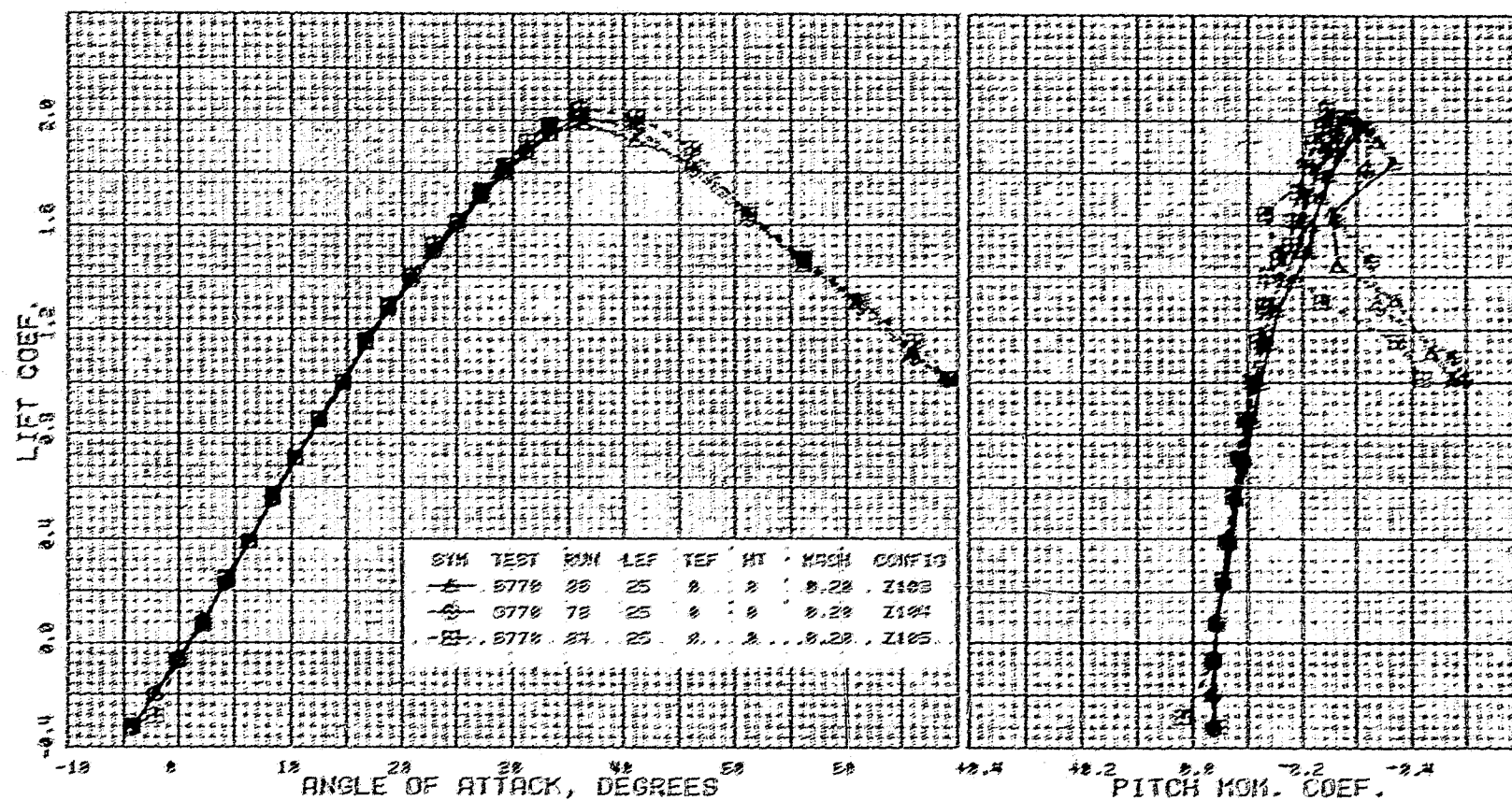


Figure 1-36 Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W3BB, HT=0
(a) Lift and Pitching Moment

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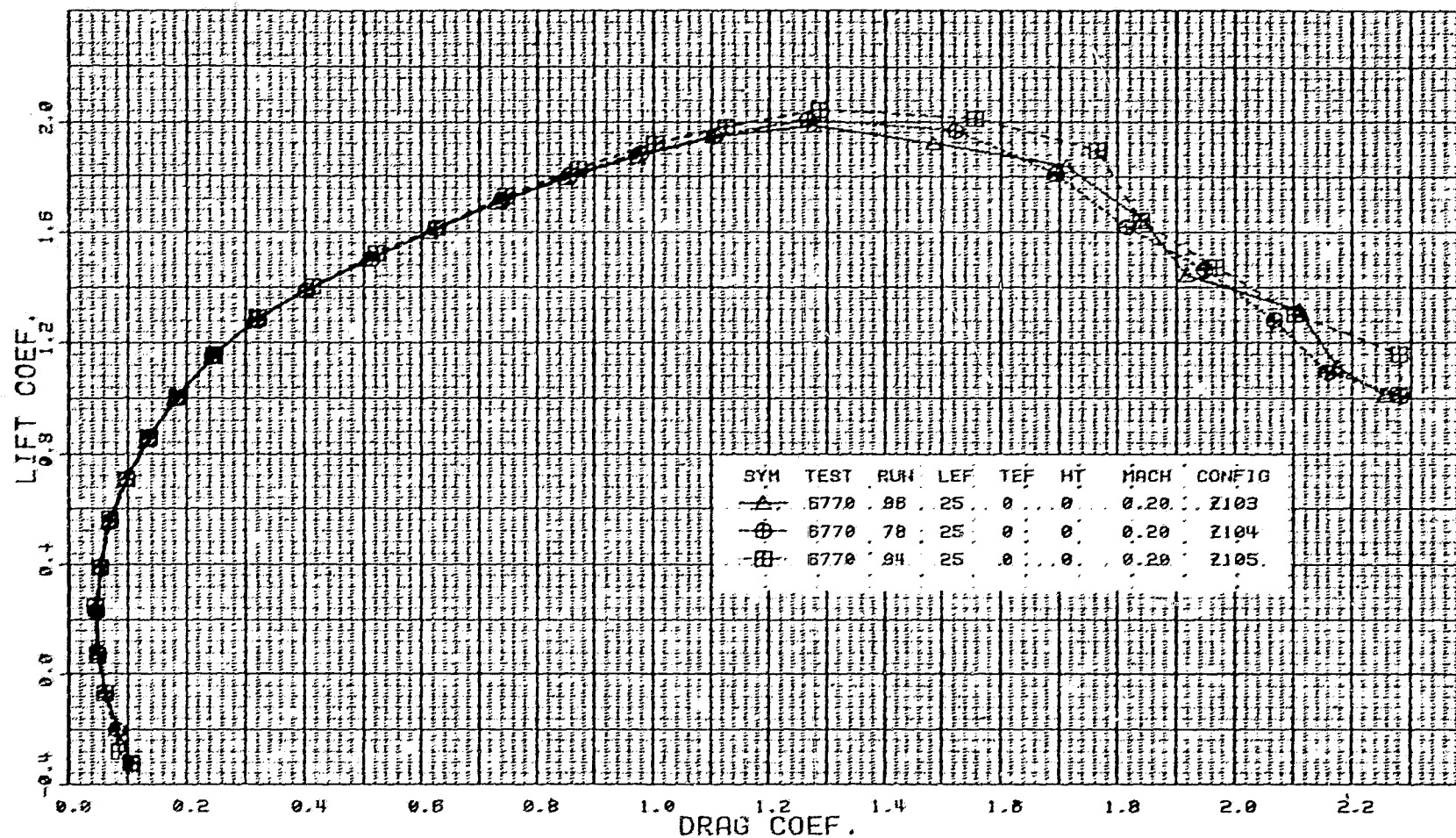


Figure 1-36 (b) Drag

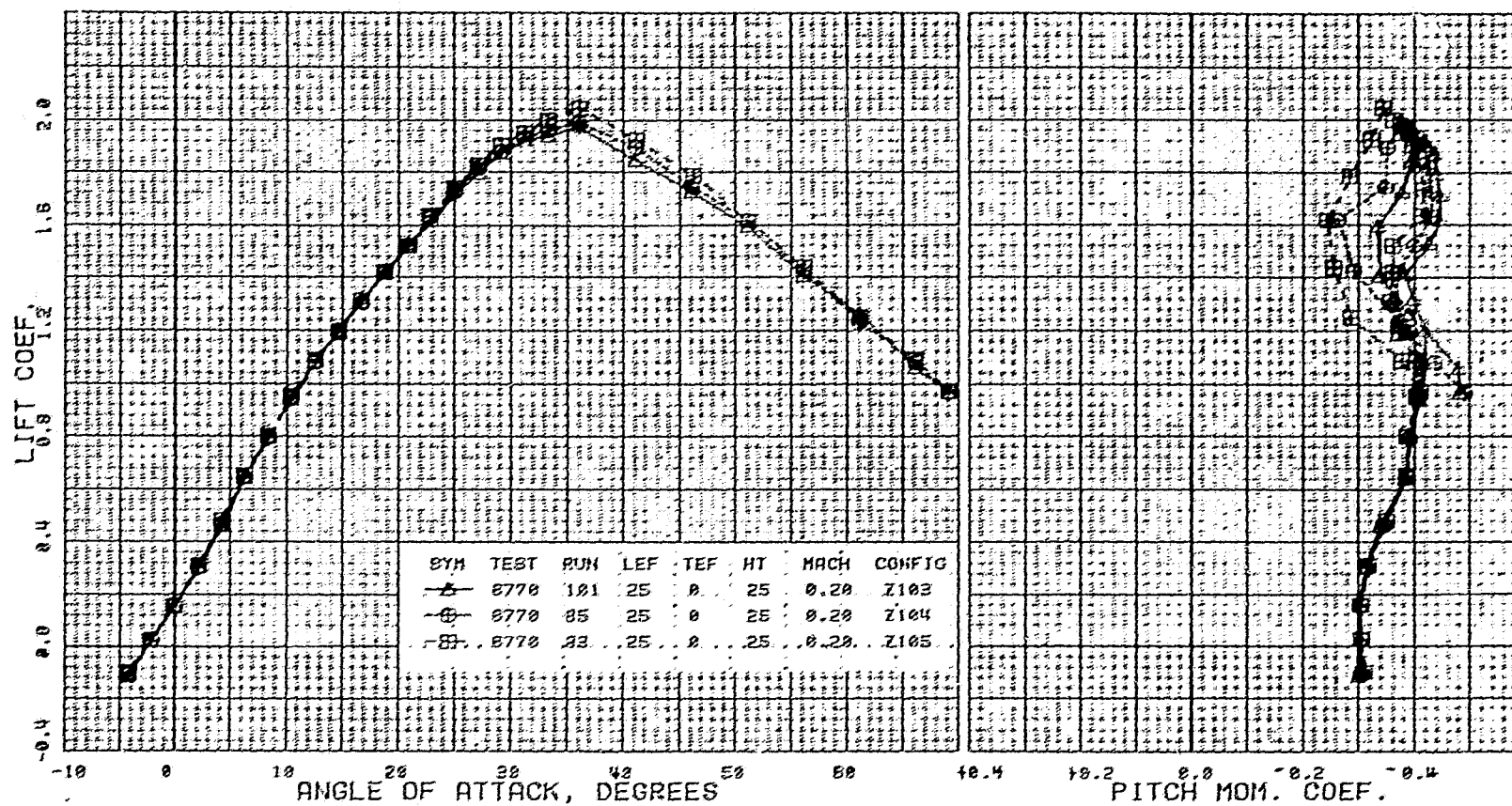


Figure 1-37 Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W3BB, HT=25°
(a) Lift and Pitching Moment

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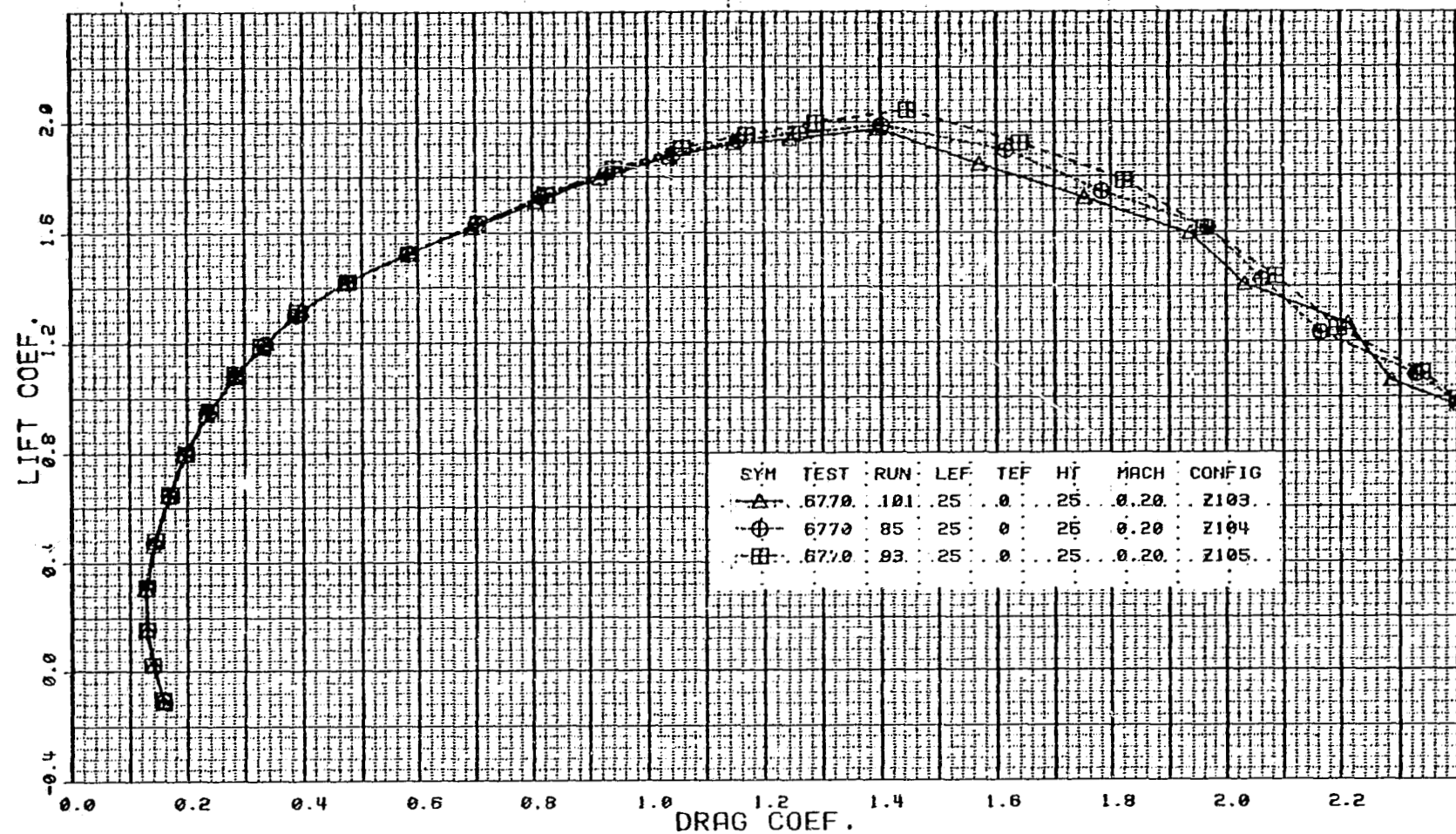


Figure 1-37 (b) Drag

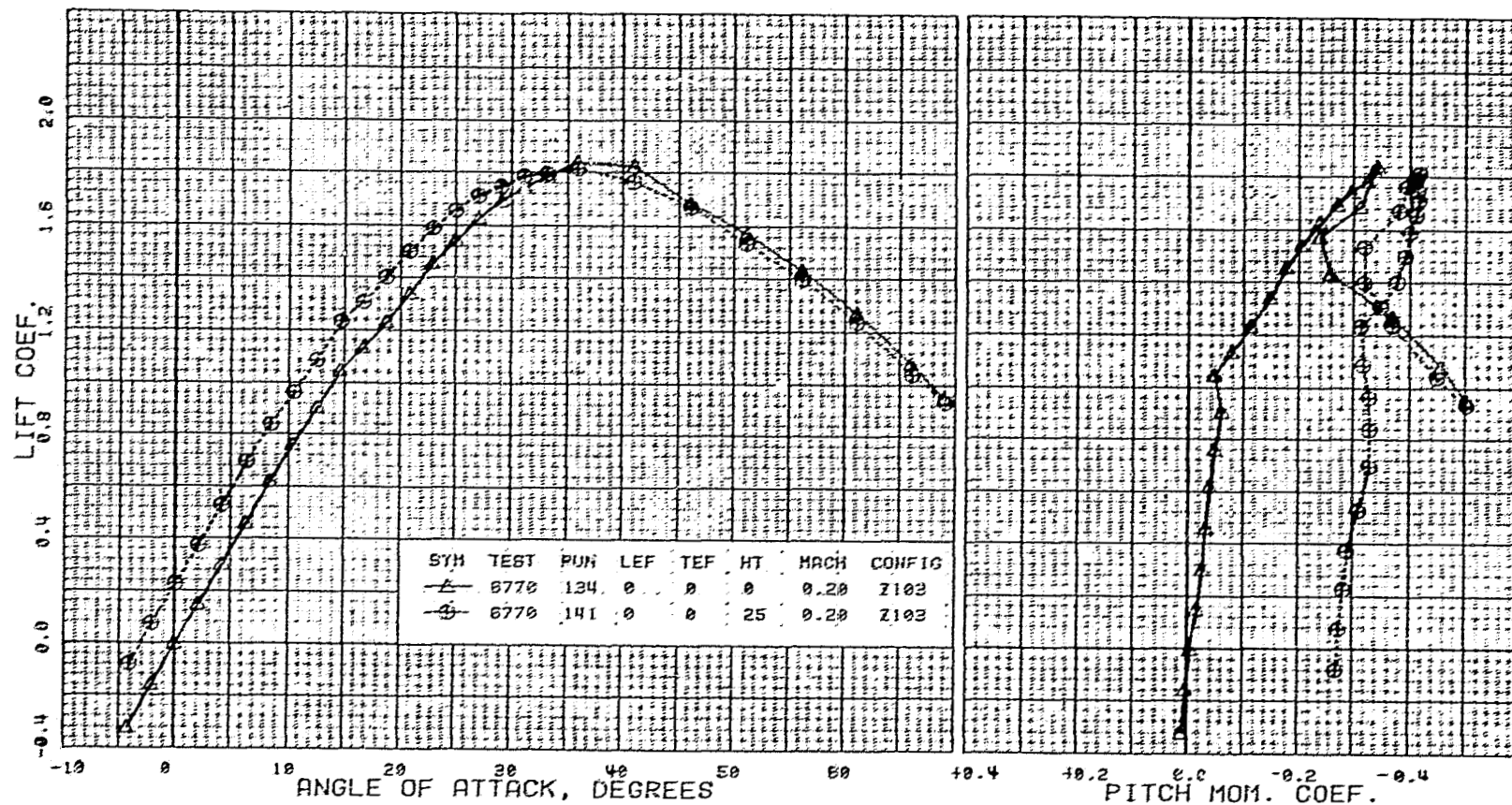


Figure 1-38 Effect of Horizontal Tail Deflection with Strake
Z103, F-16 with Wing W24
(a) Lift and Pitching Moment

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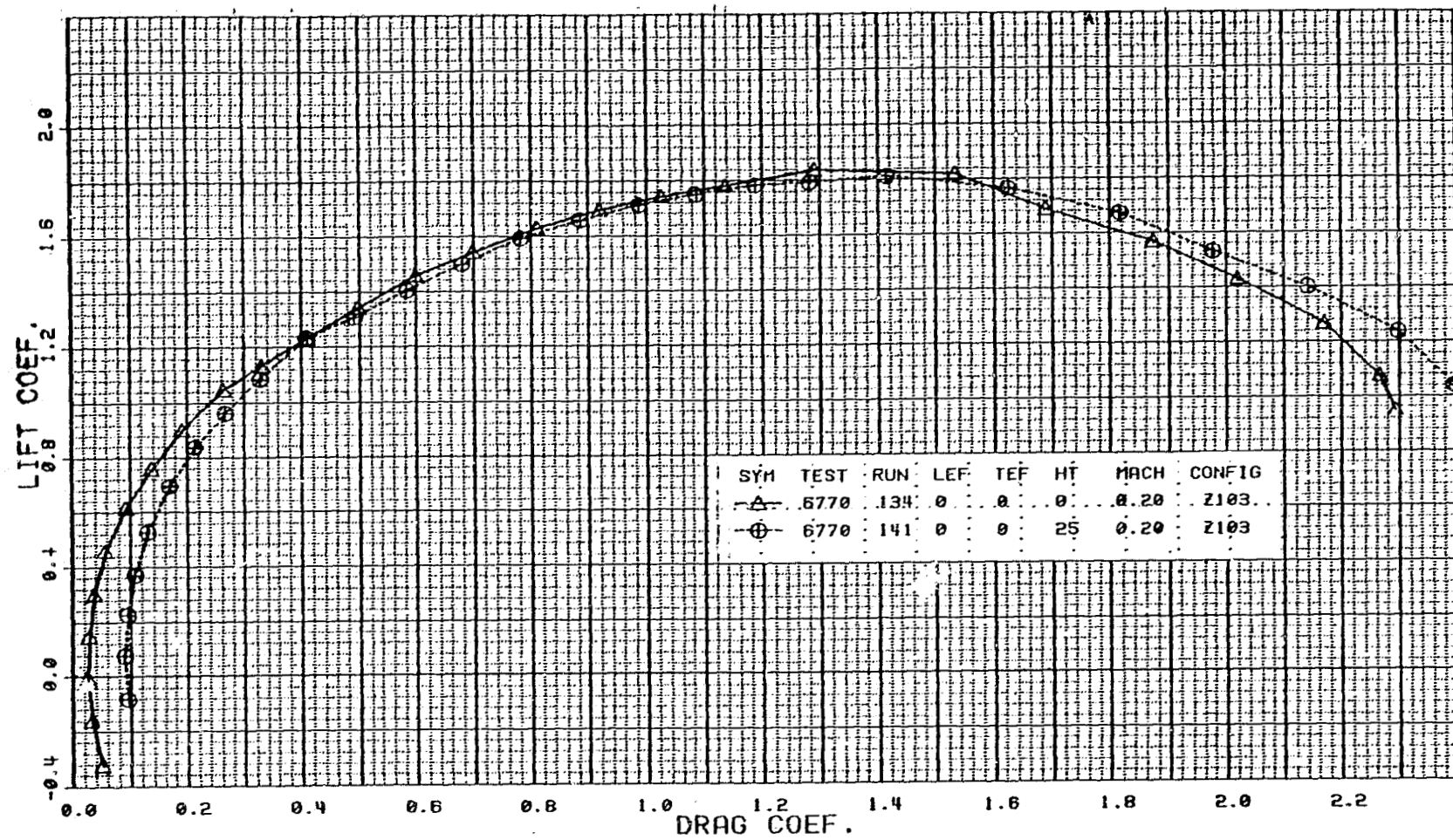


Figure 1-38 (b) Drag

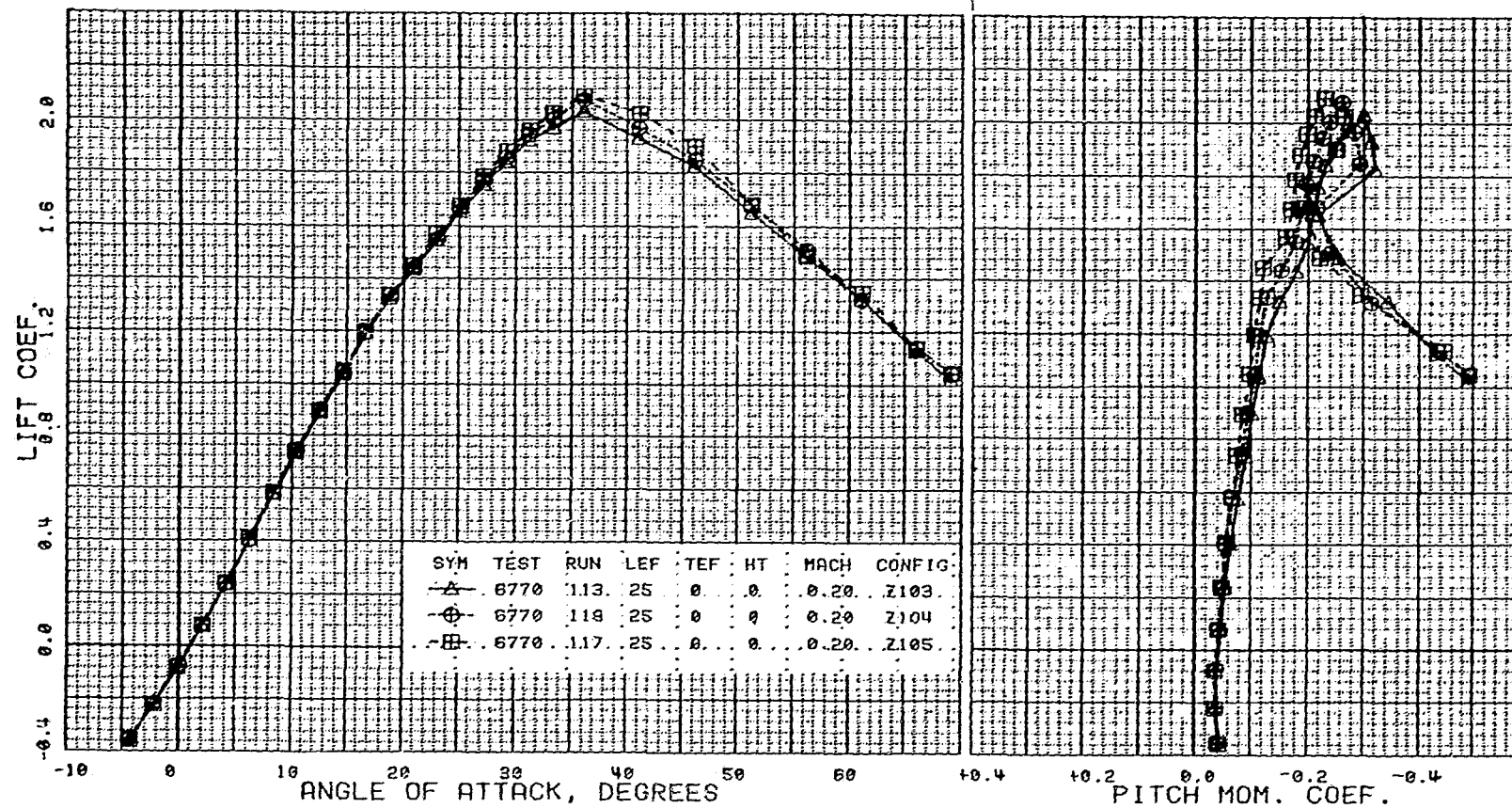


Figure 1-39 Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W24, HT=0
(a) Lift and Pitching Moment

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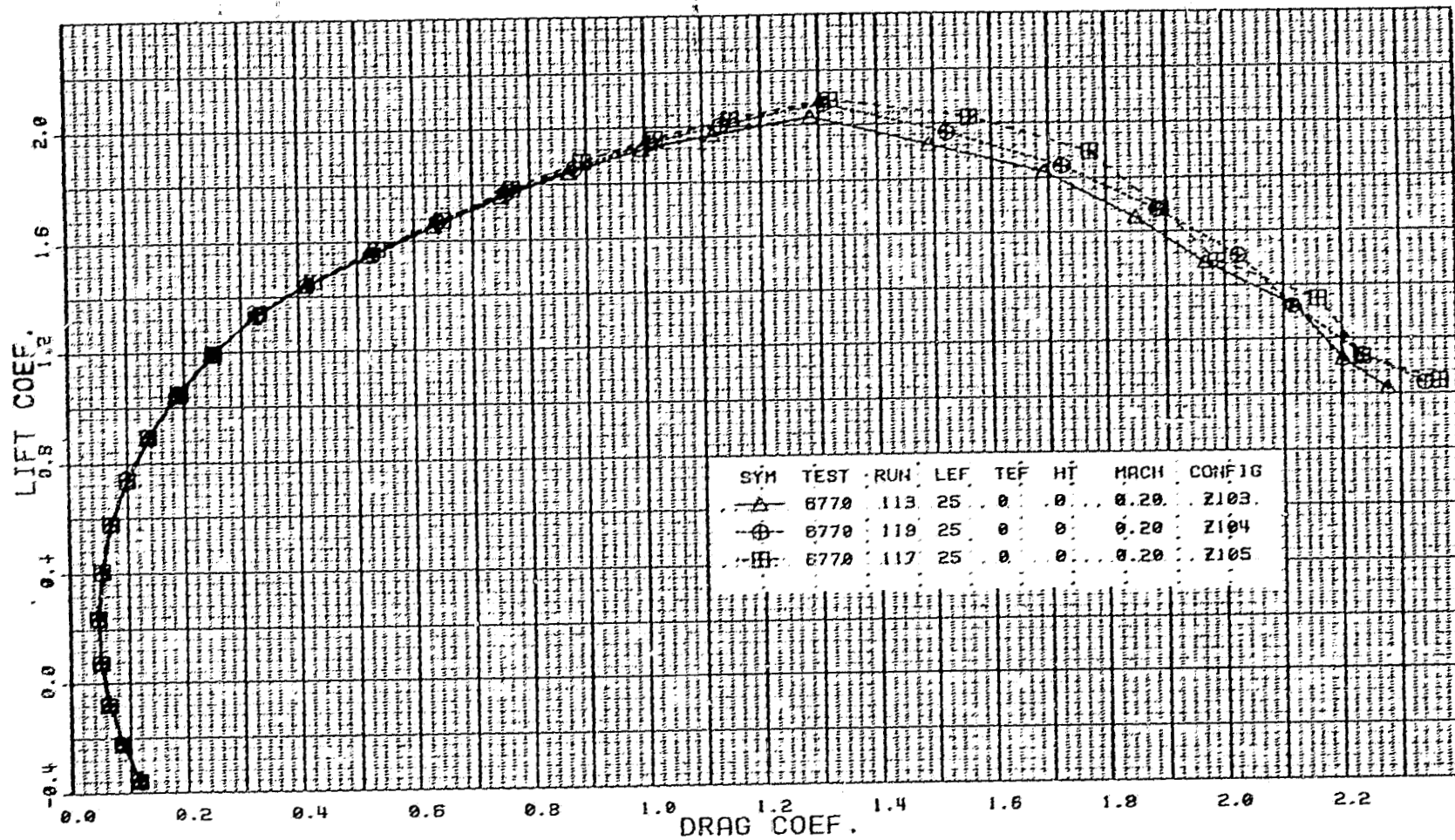


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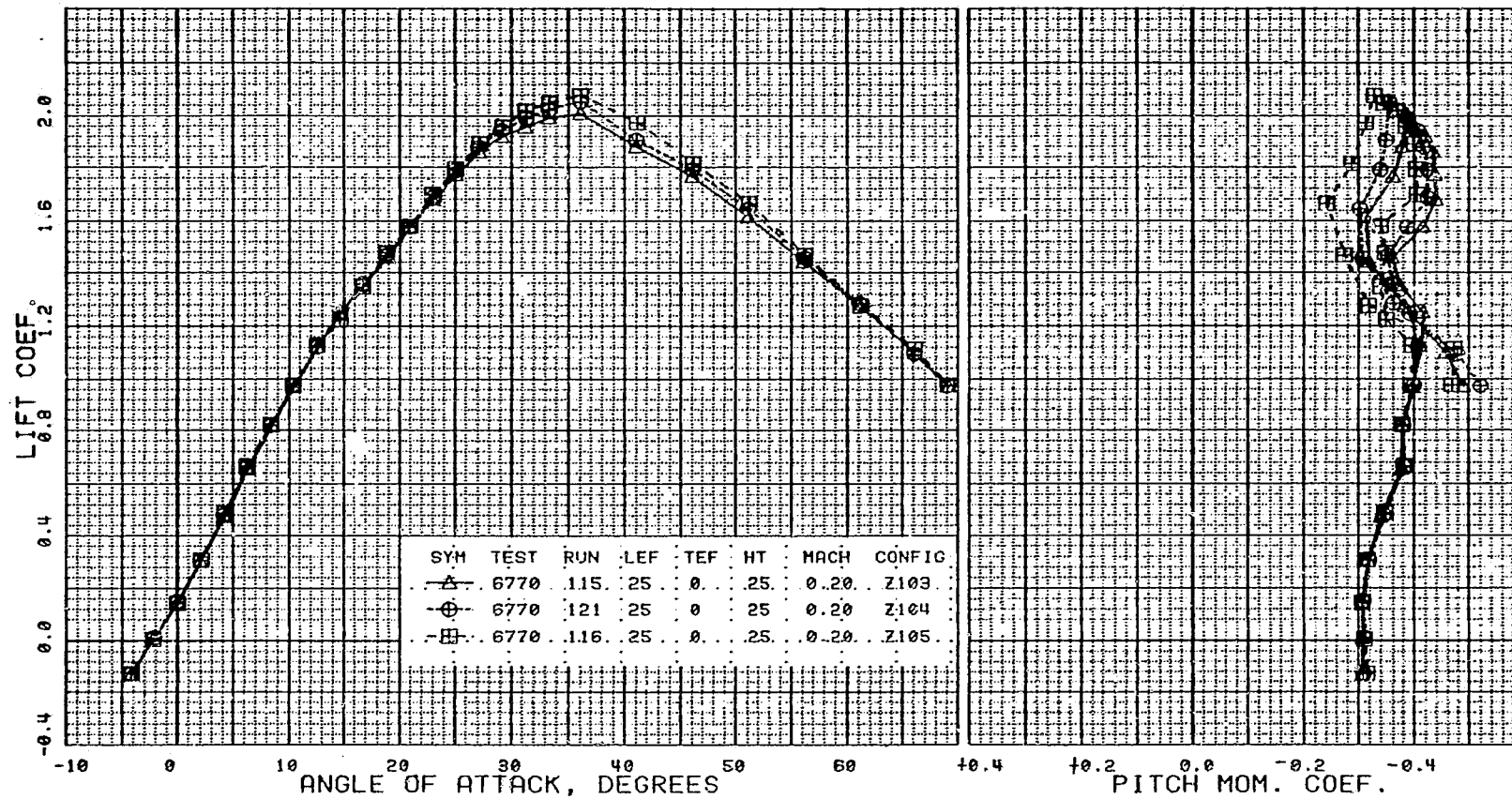


Figure 1-40 Effect of Forebody Strake Size (Z103-Z105), F-16 with
Wing W24, HT=+25°
(a) Lift and Pitching Moment

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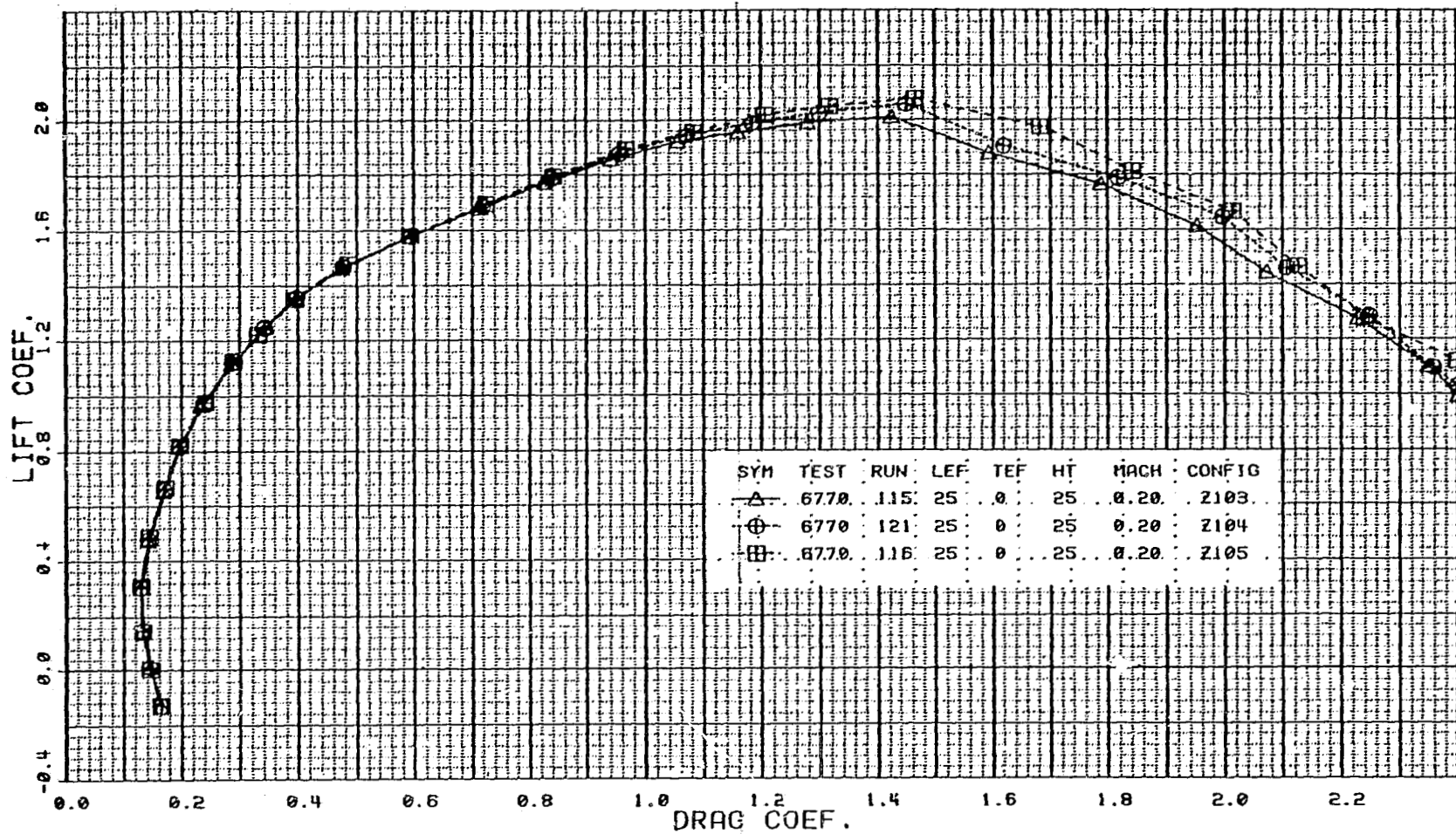


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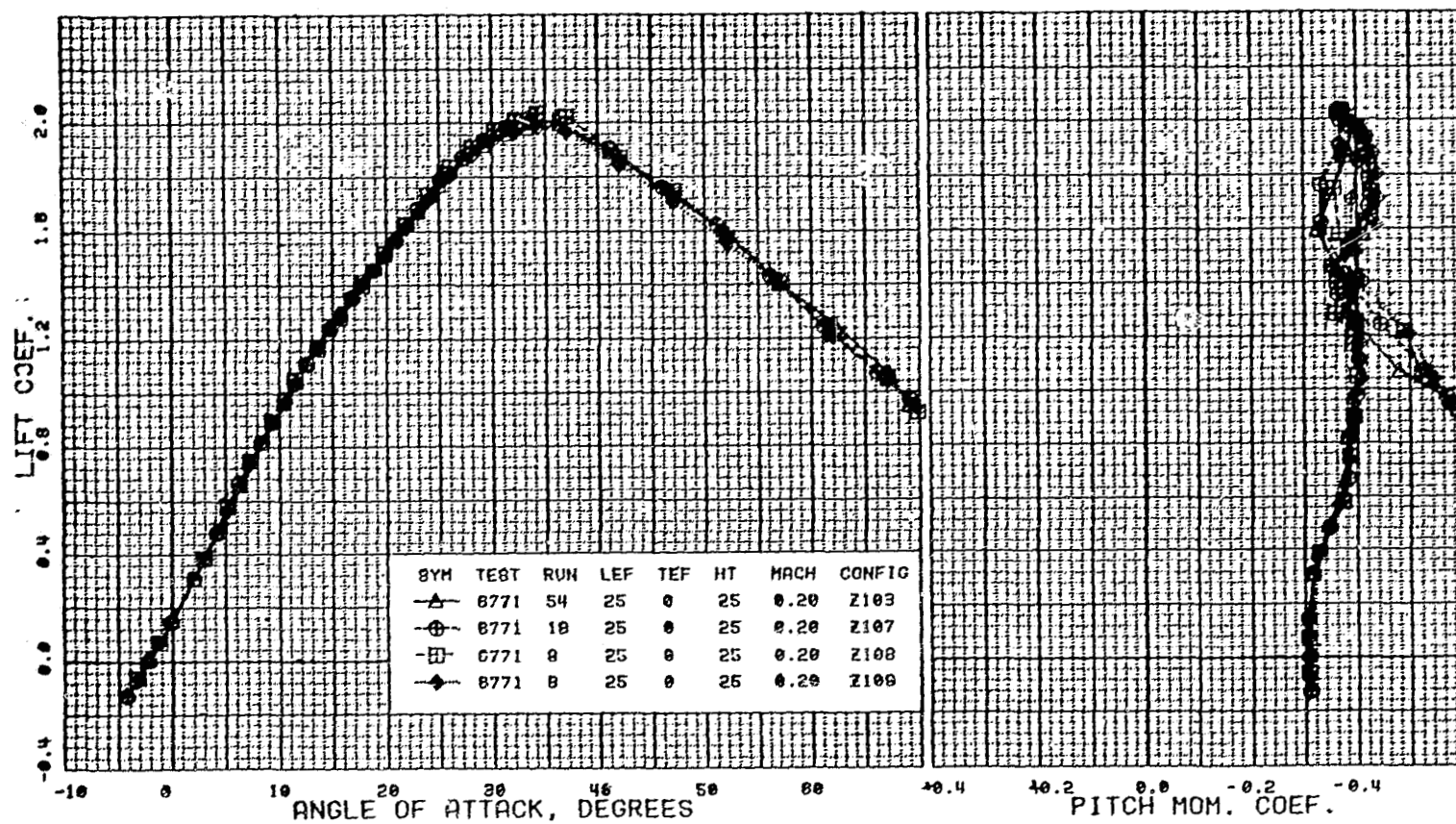


Figure 1-41 Effect of Forebody Strake Shape (Z103, Z107-Z109), F-16 with Wing W24
(a) Lift and Pitching Moment

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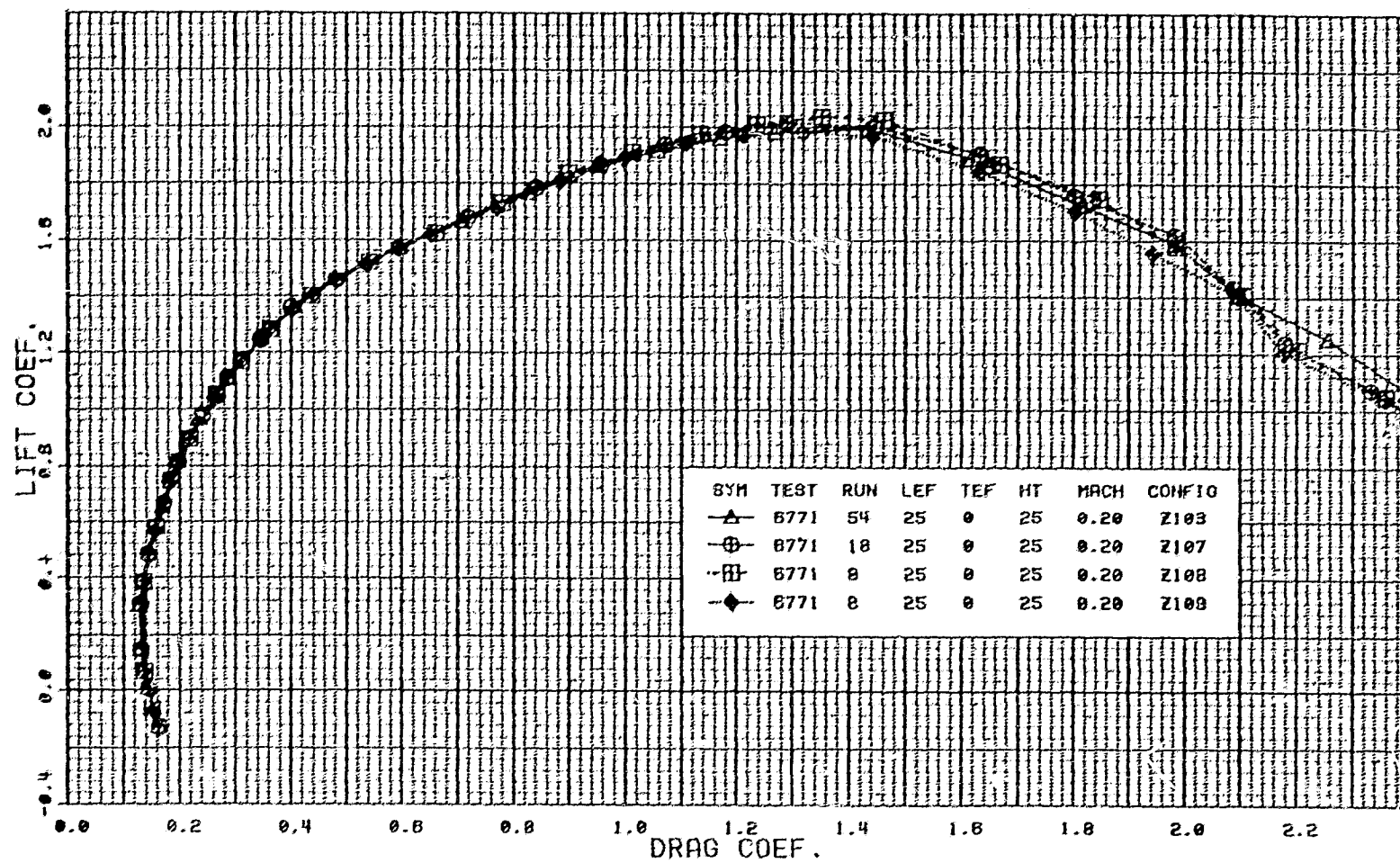


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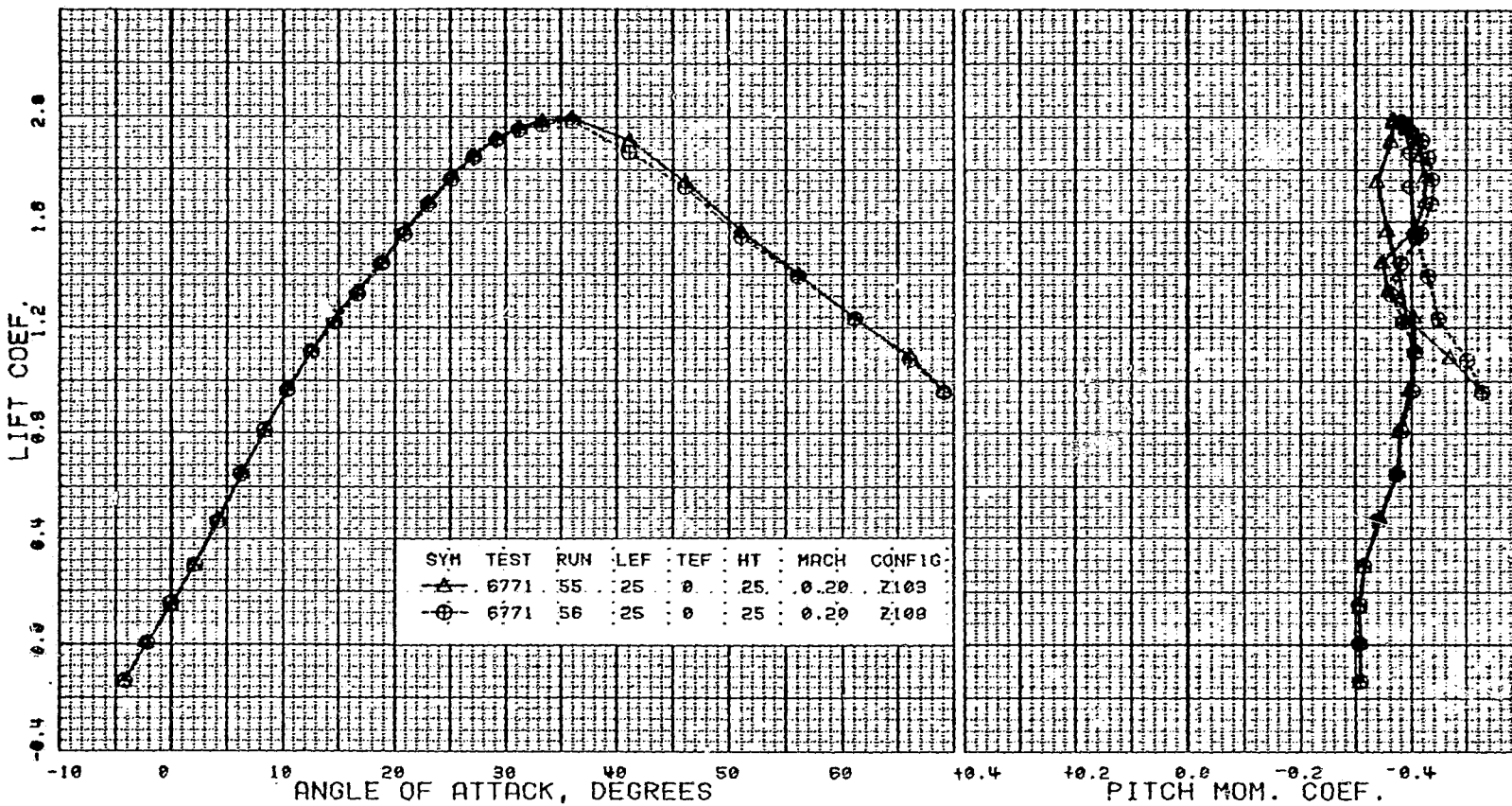


Figure 1-42 Effect of Forebody Strake Forward Extent (Z103, Z109) with Nose Strake Z112, F-16 with Wing W24
(a) Lift and Pitching Moment

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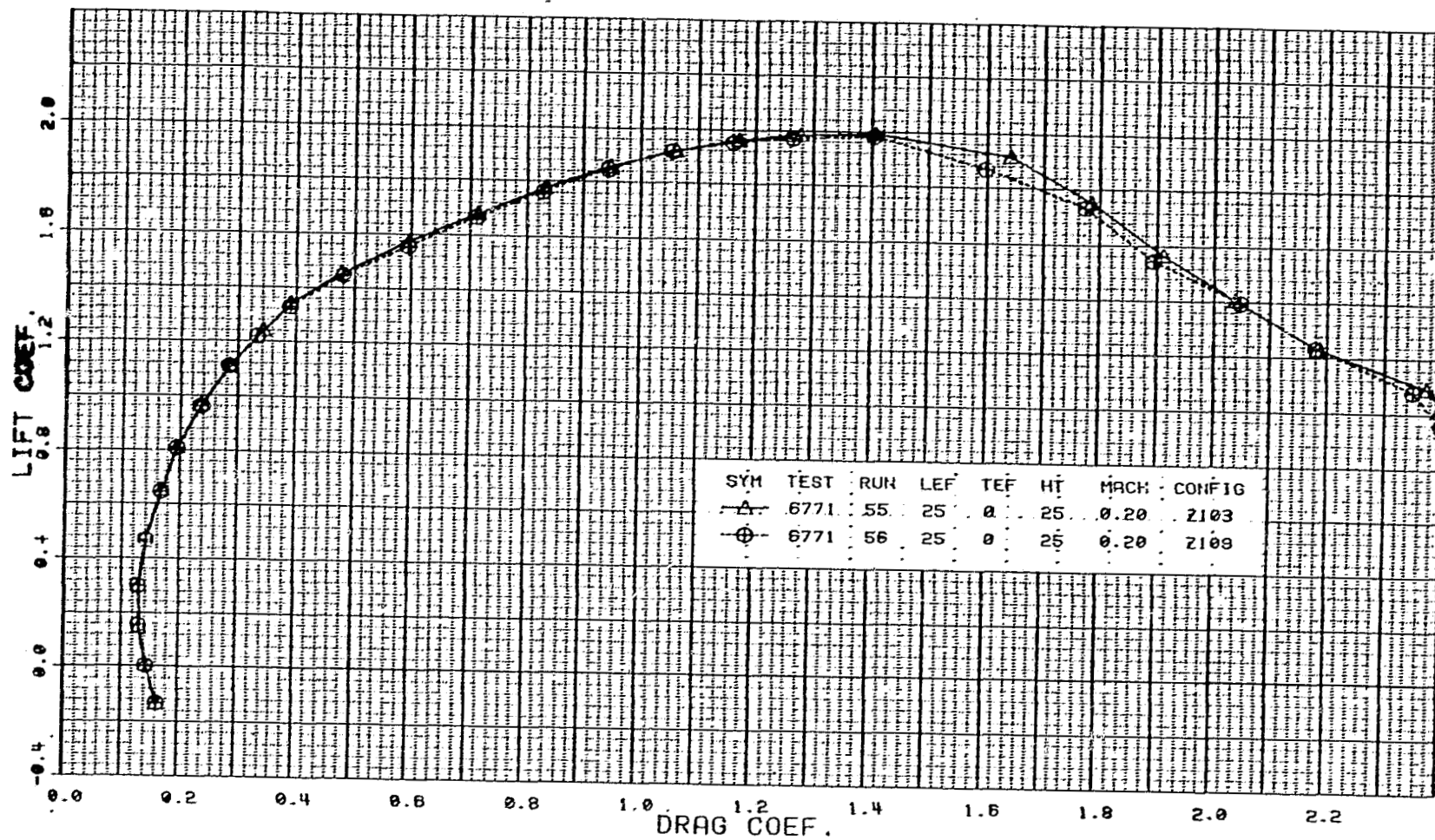


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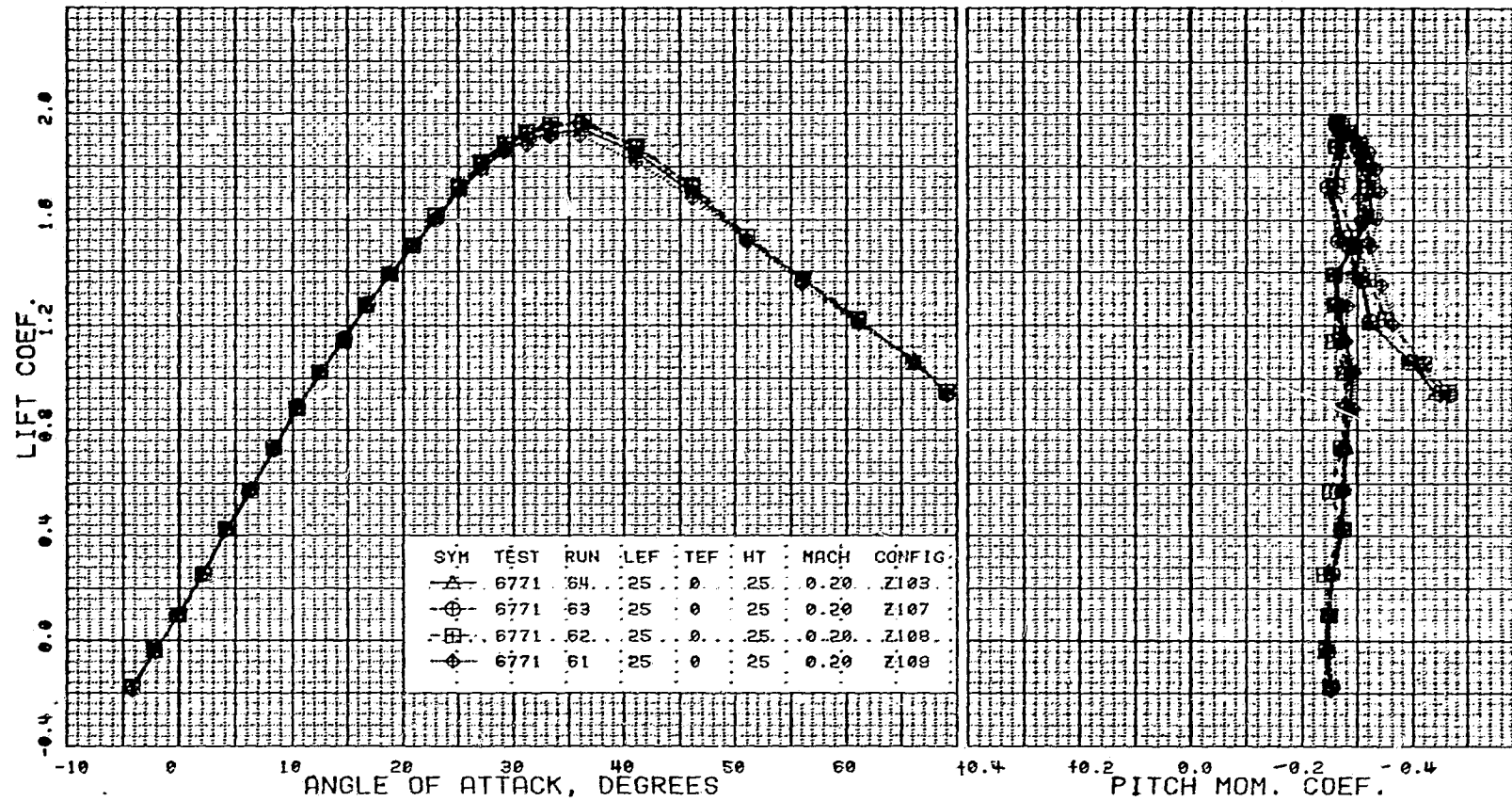


Figure 1-43 Effect of Forebody Strake Shape (Z103,Z107-Z109) with Nose Strake Z112, F-16 with Wing W24
(a) Lift and Pitching Moment

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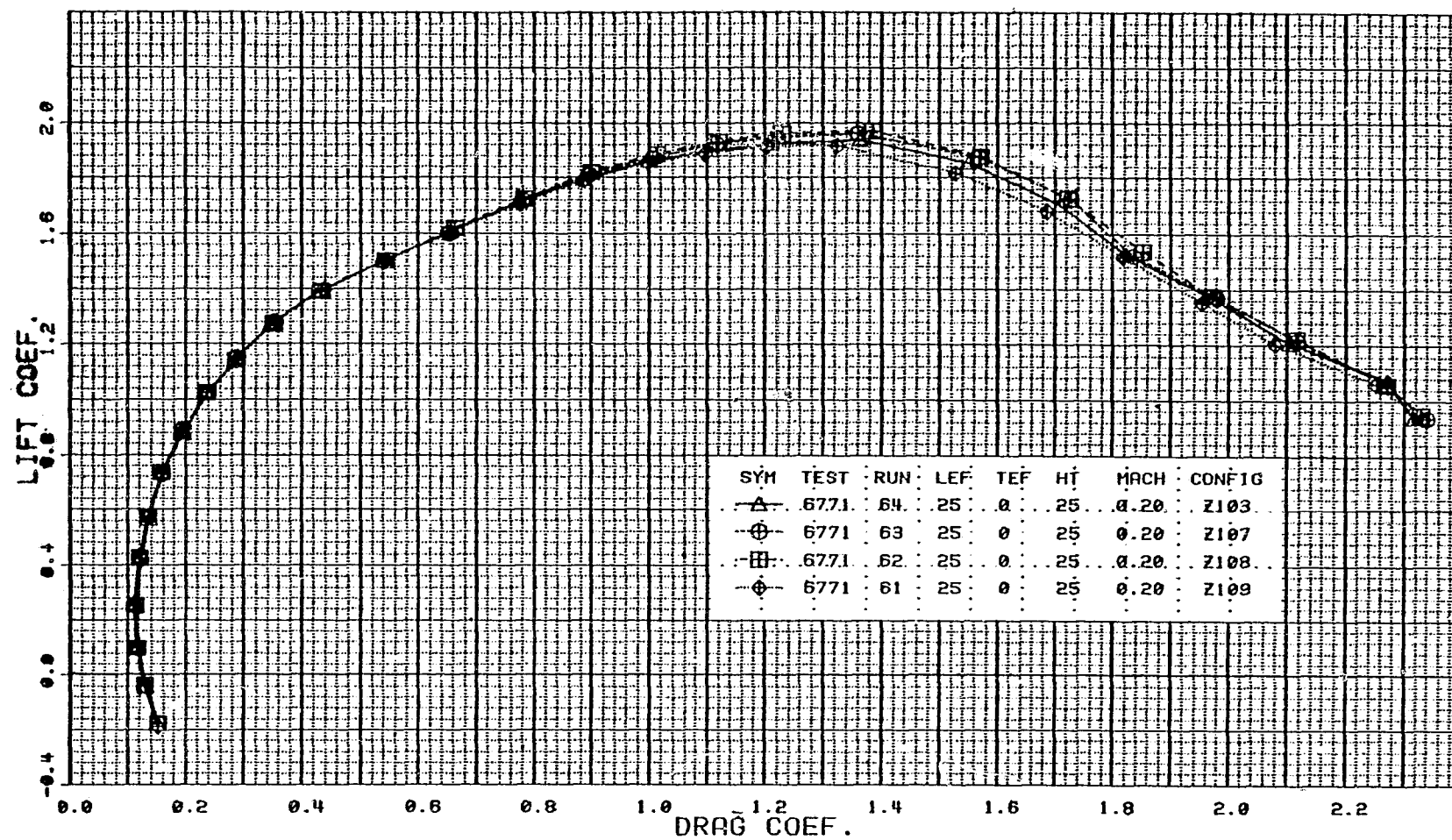


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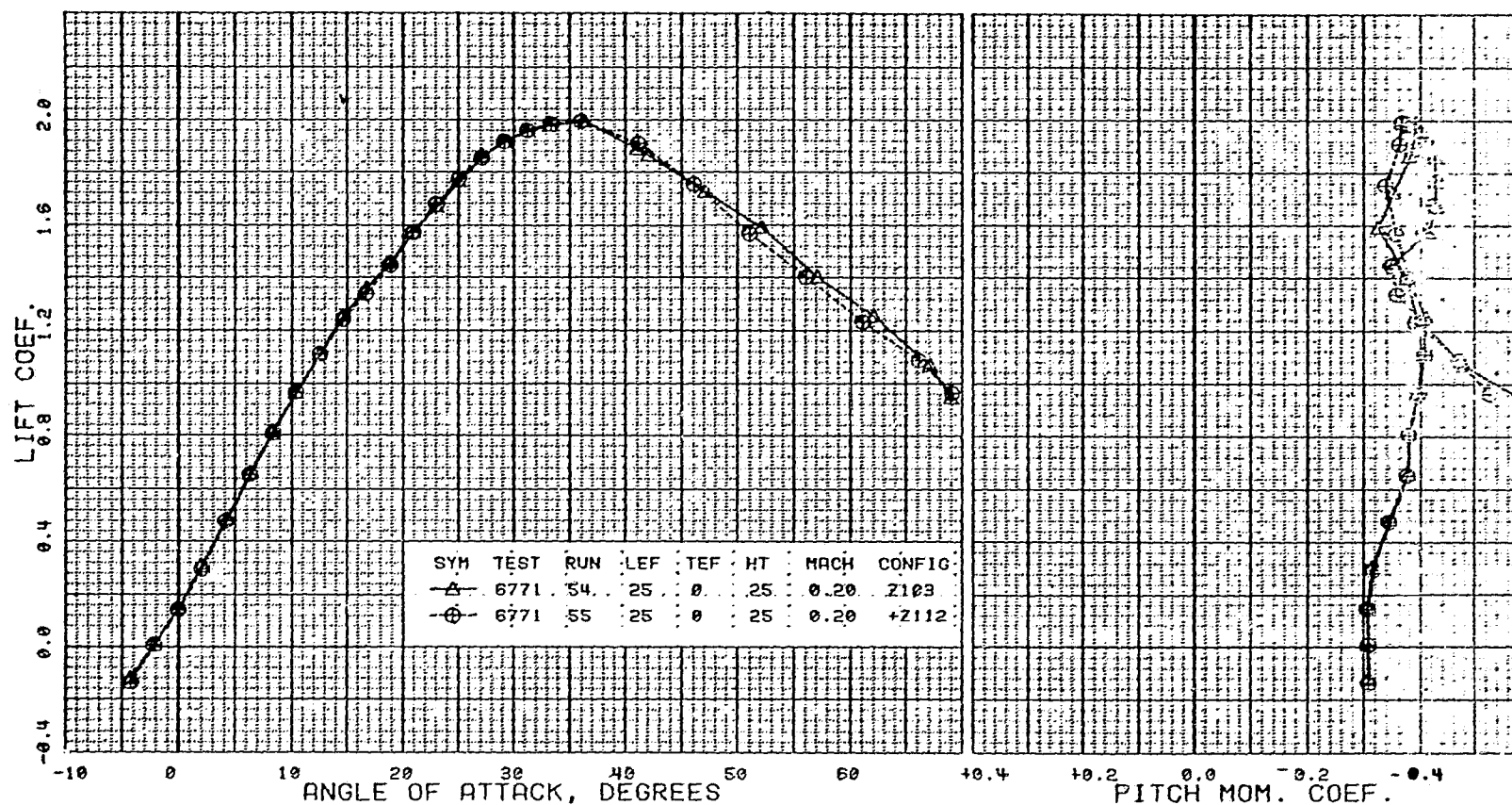


Figure 1-44 Effect of Nose Strake Z112 with Forebody Strake Z103, F-16 with Wing W24
(a) Lift and Pitching Moment

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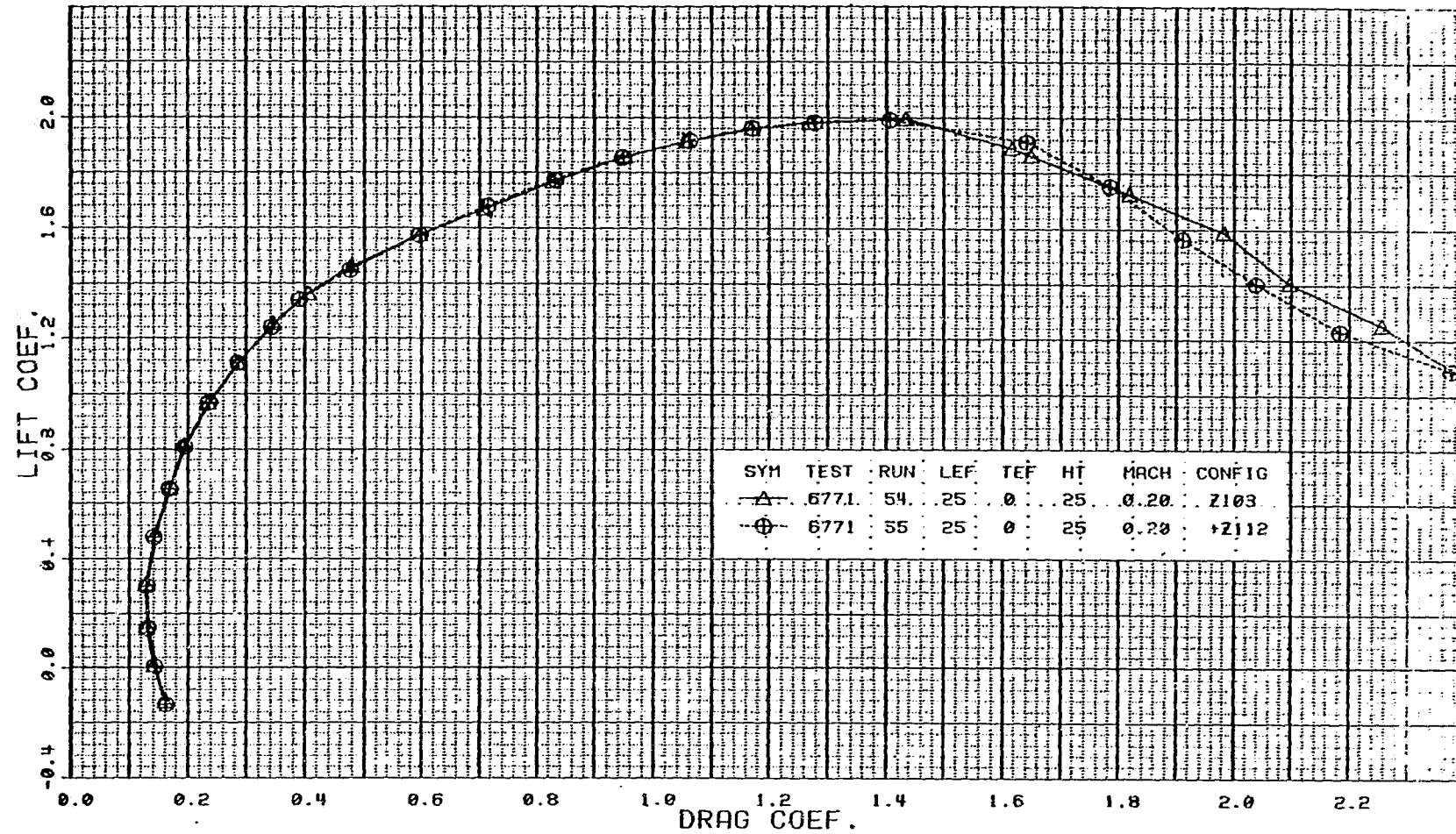


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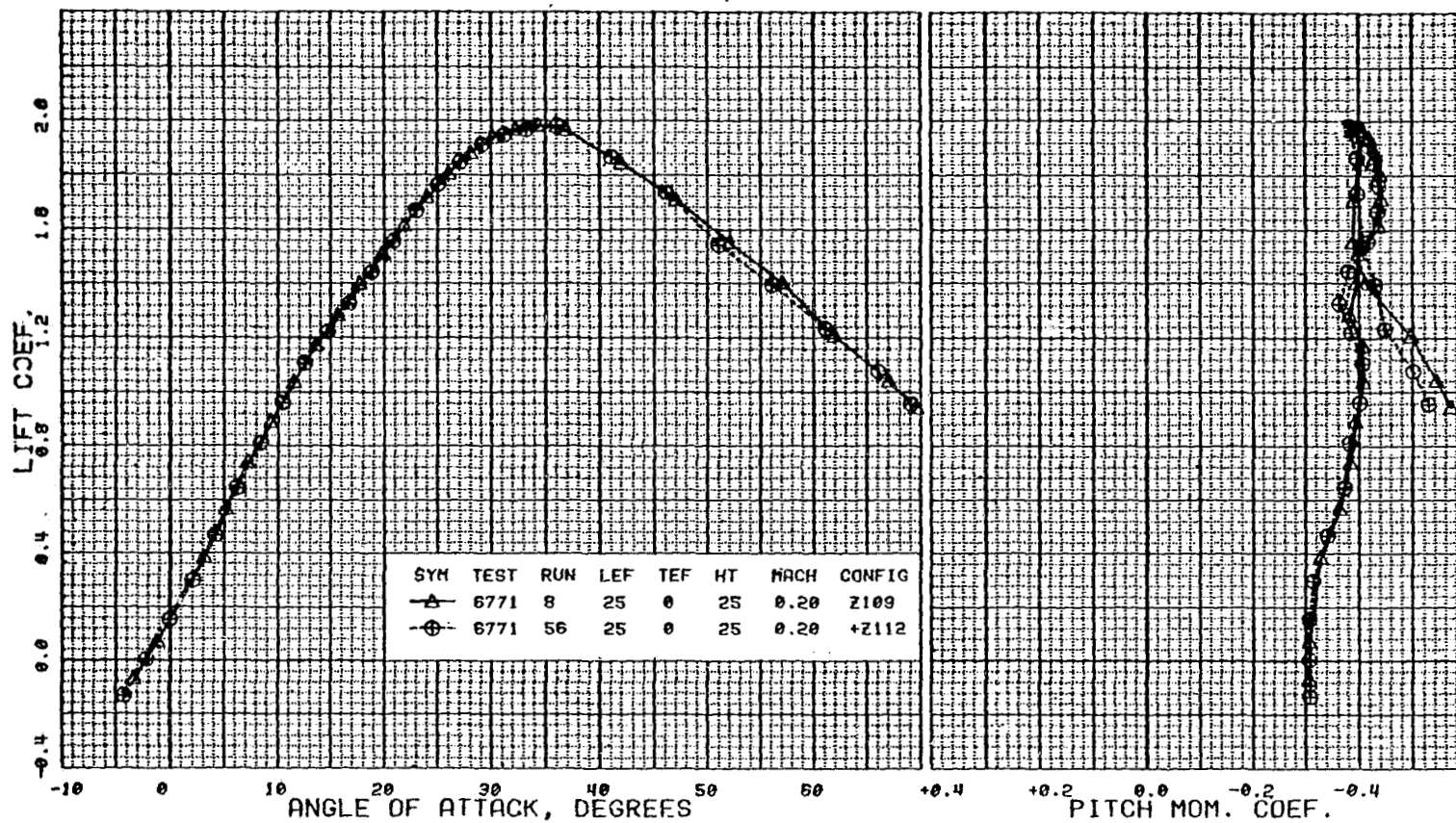


Figure 1-45 Effect of Nose Strake Z112 with Forebody Strake
Z109, F-16 with Wing W24
(a) Lift and Pitching Moment

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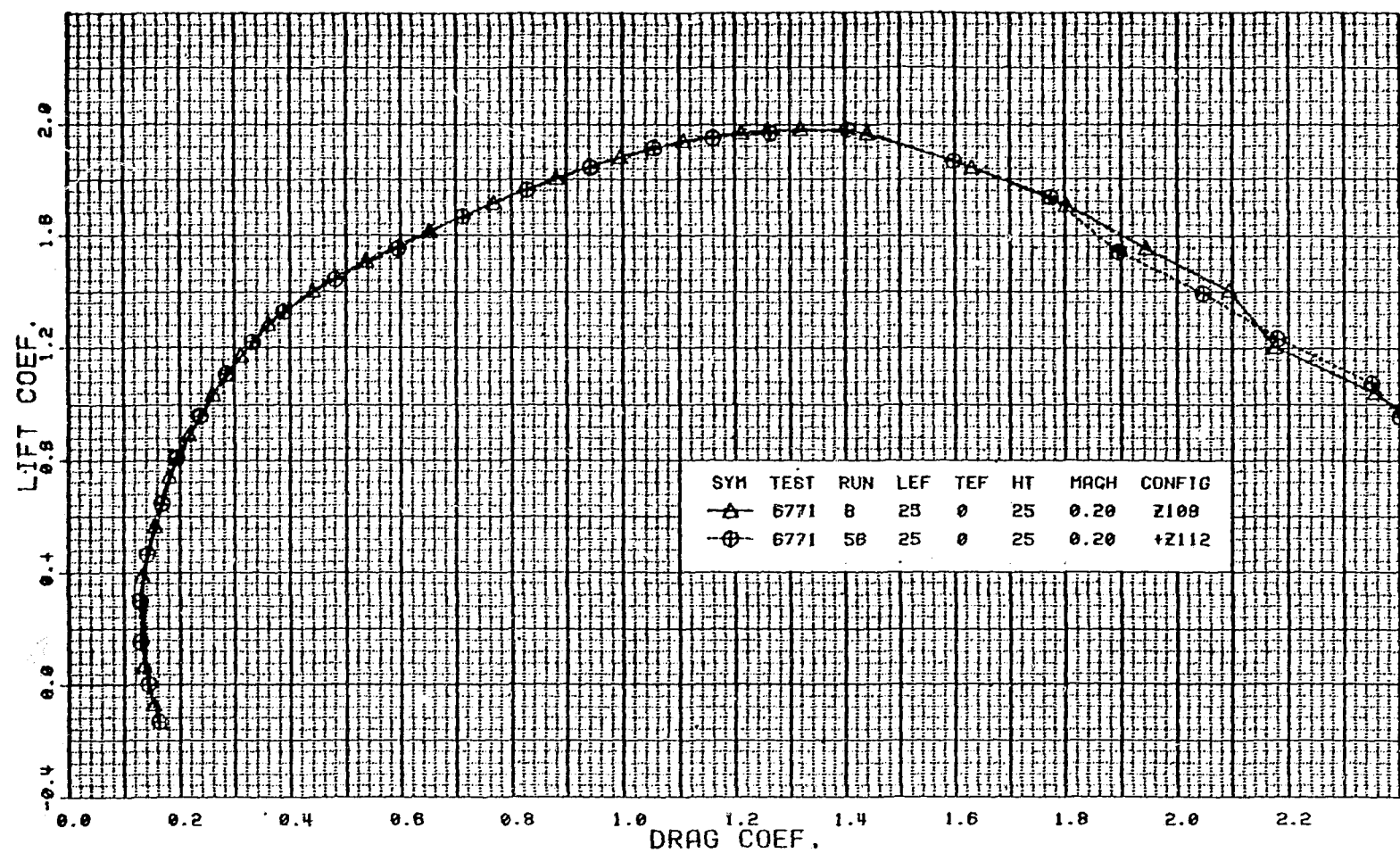


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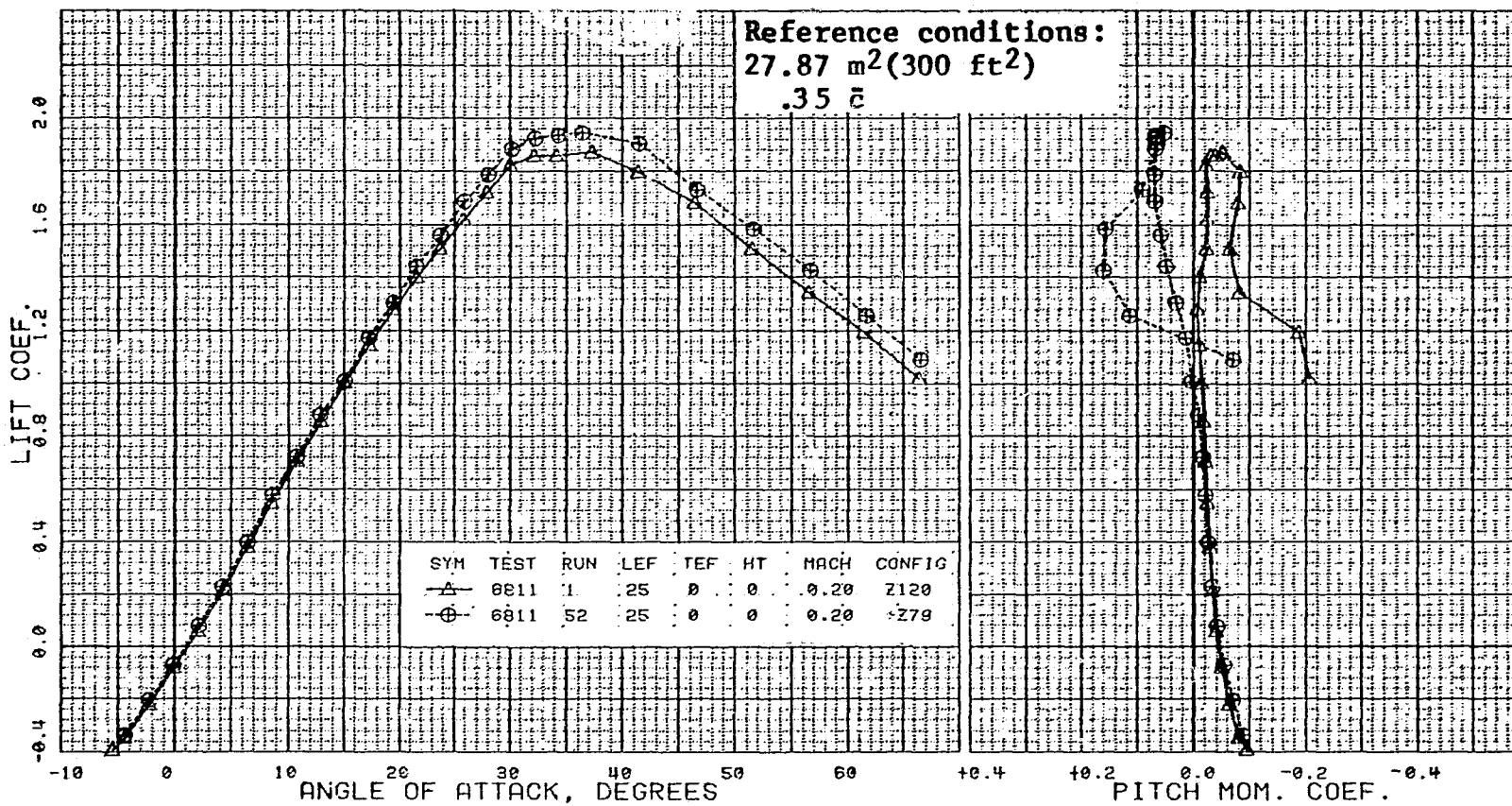


Figure 1-46 Effect of Canard Strake Z79, F-16
 (a) Lift and Pitching Moment

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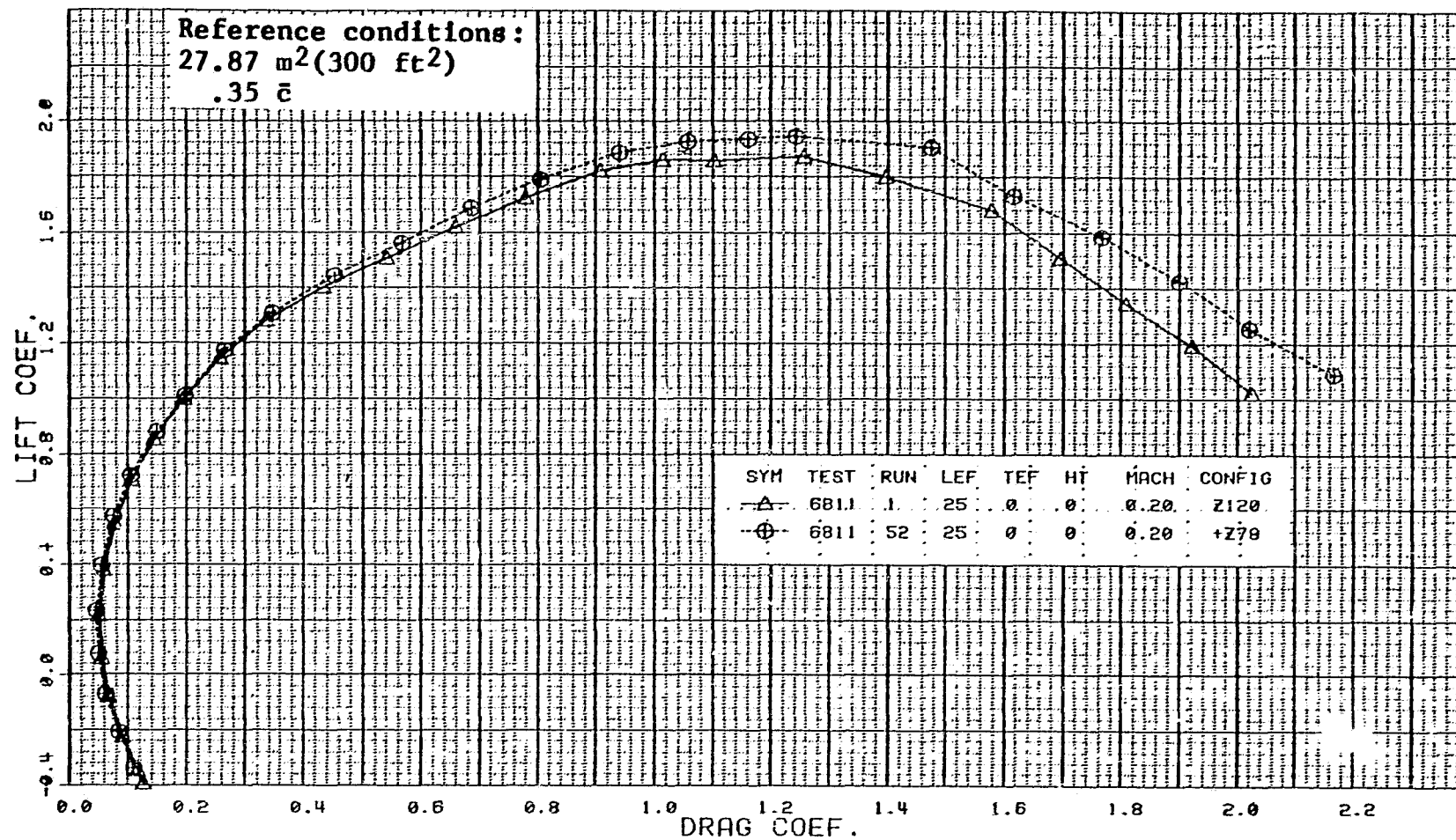


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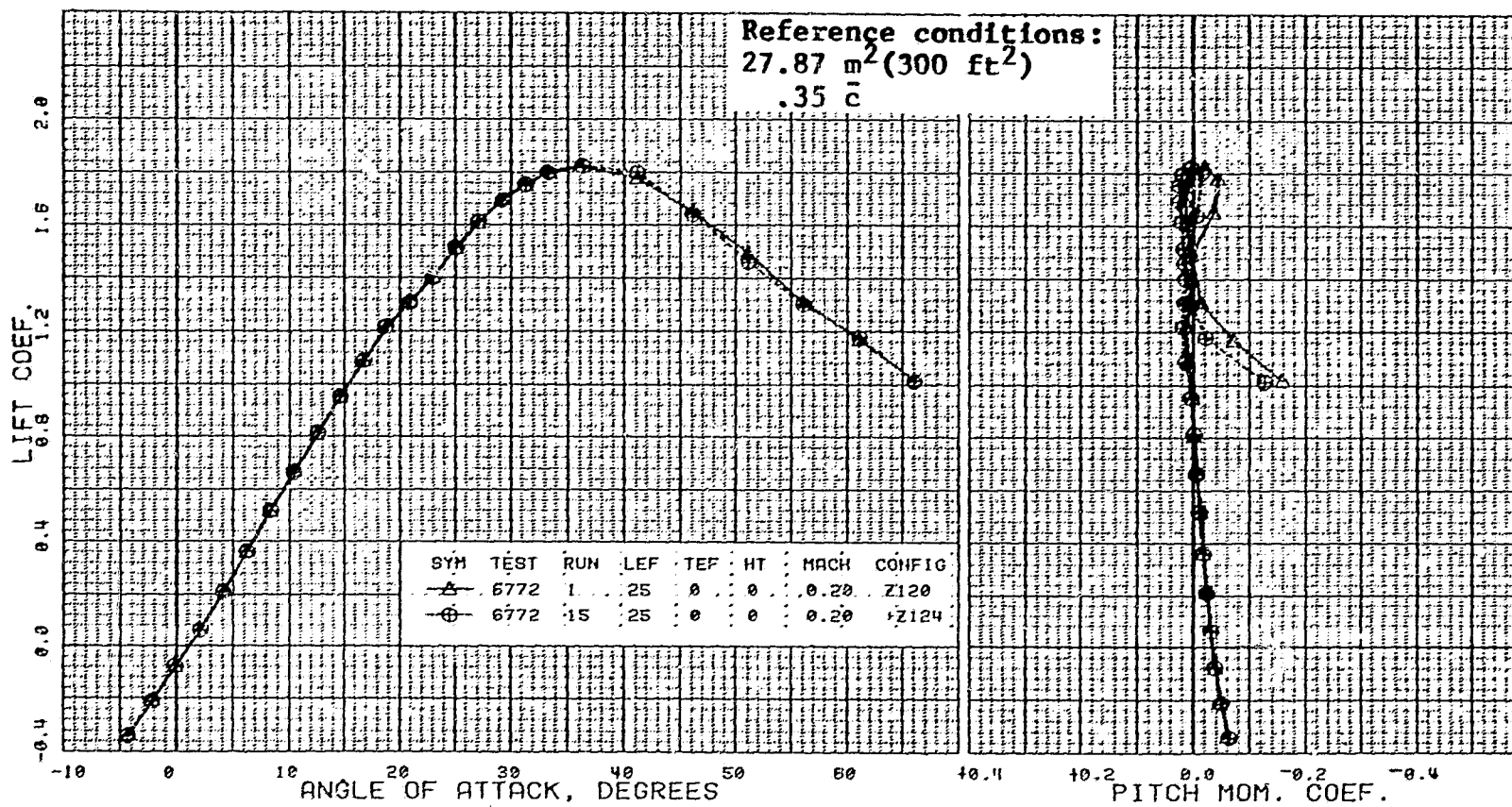


Figure 1-47 Effect of Nose Strake Z124 with Nose Probe, F-16 with Wing W24
 (a) Lift and Pitching Moment

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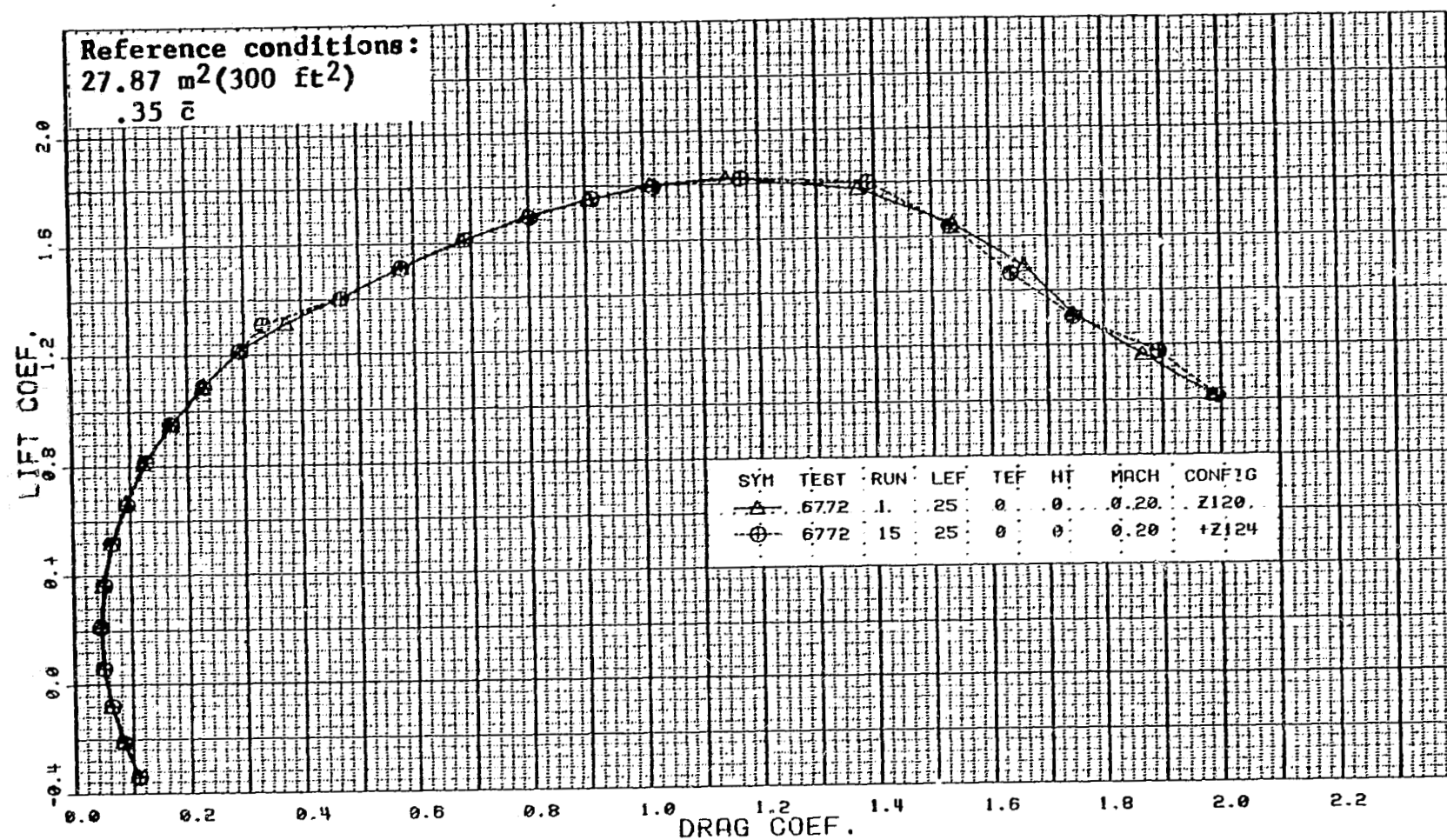


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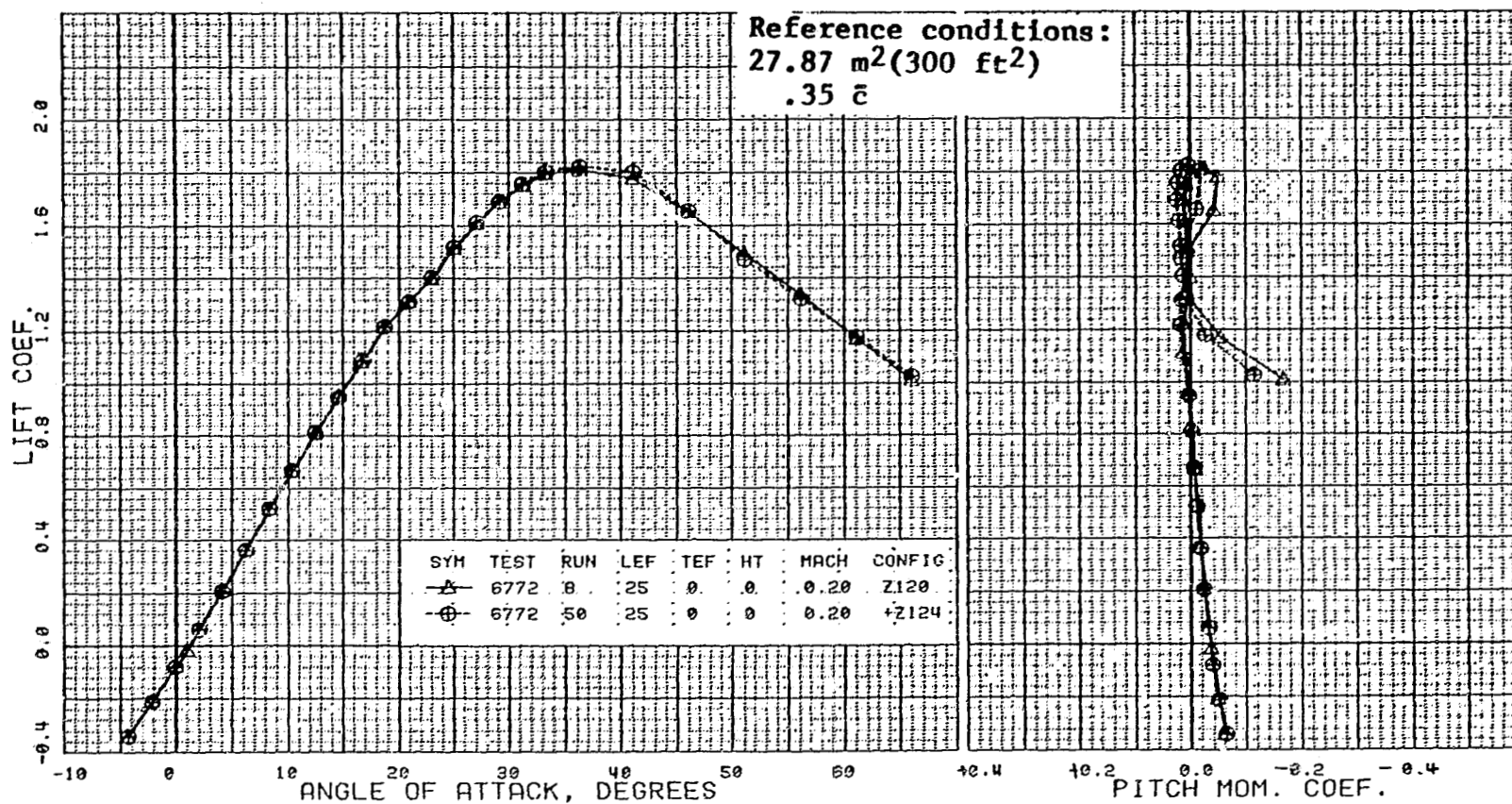


Figure 1-48 Effect of Nose Strake Z124 without Nose Probe, F-16 with Wing W24
 (a) Lift and Pitching Moment

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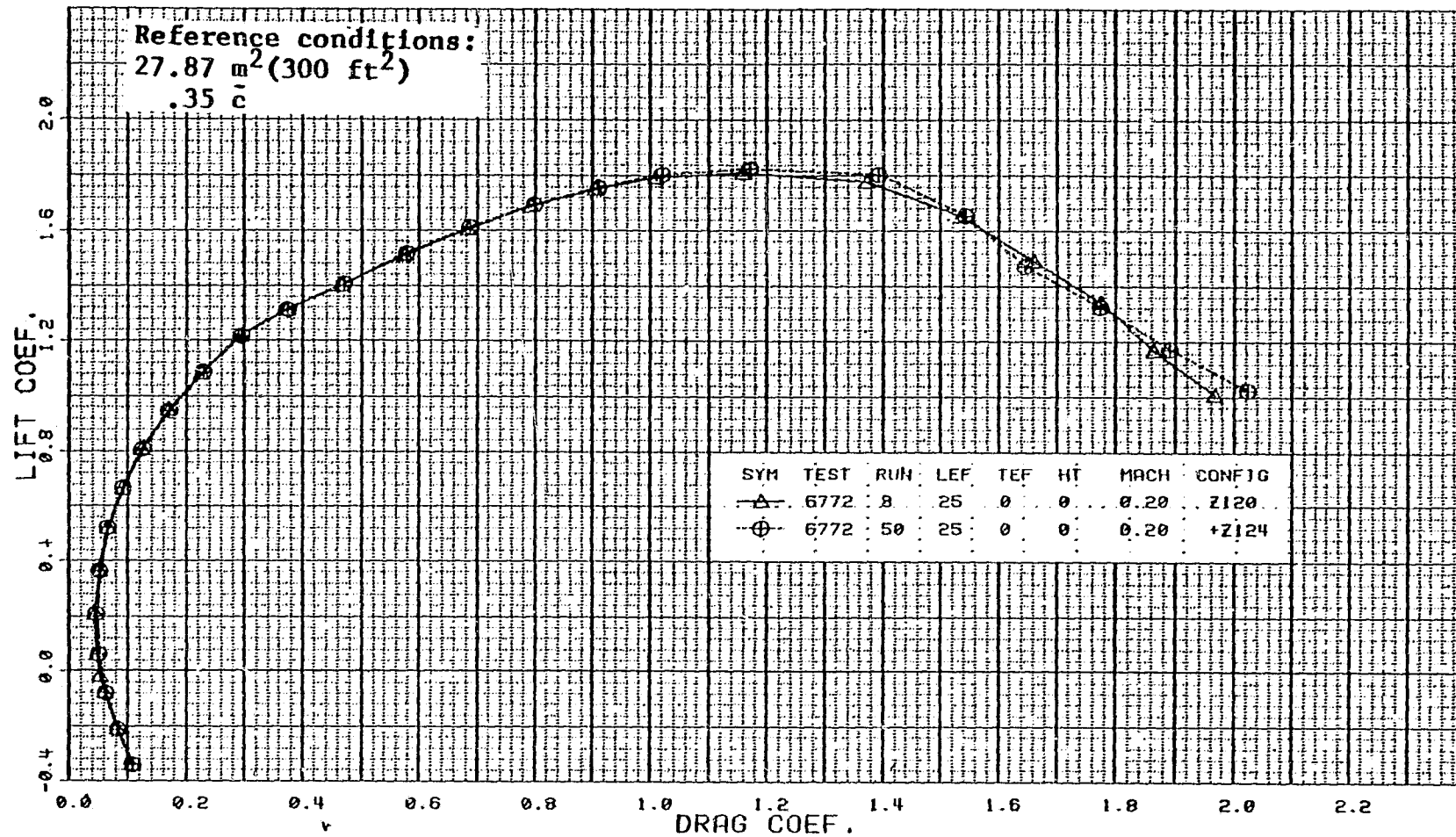


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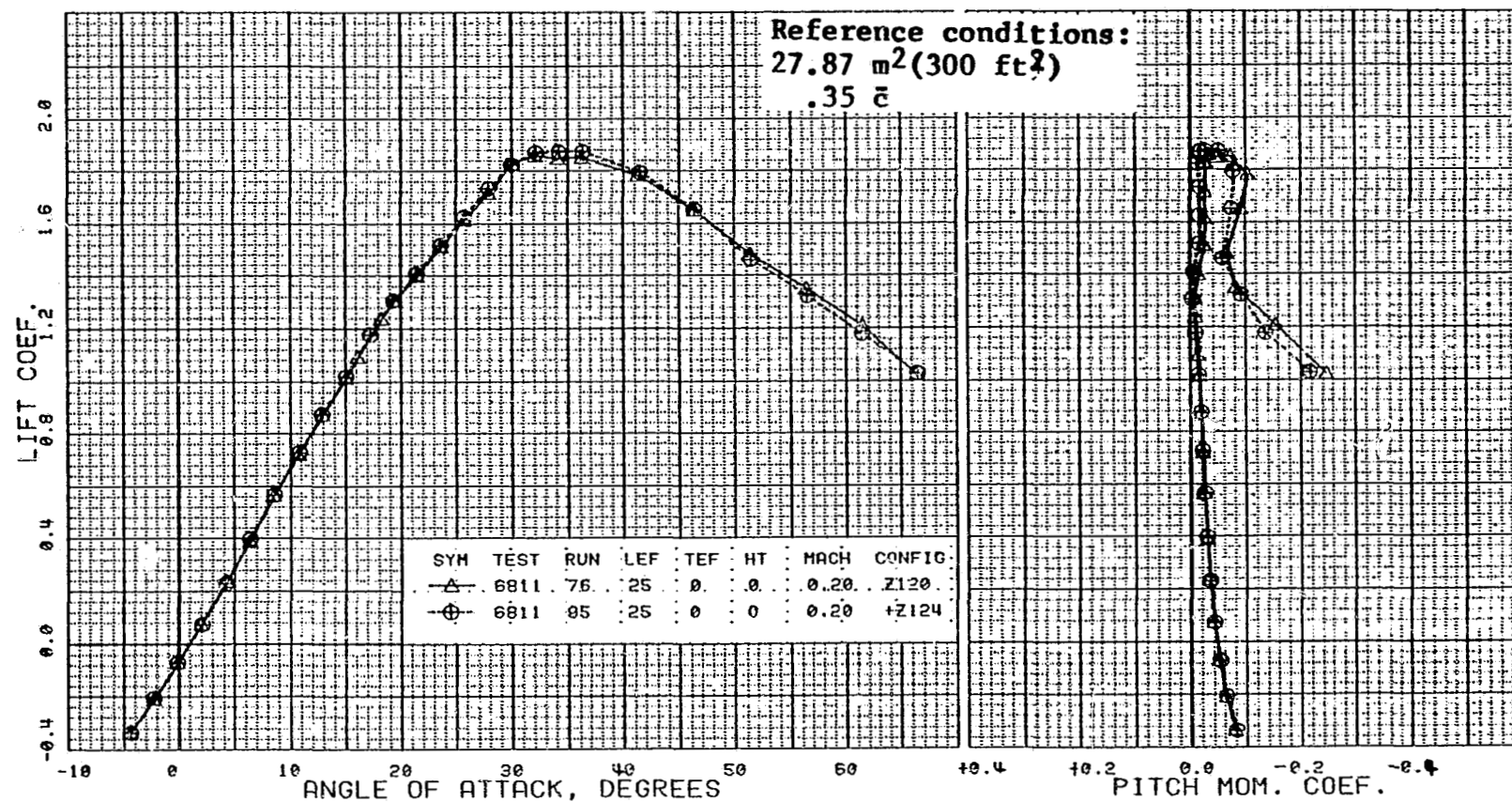


Figure 1-49 Effect of Nose Strake Z124, F-16, HT=0
 (a) Lift and Pitching Moment

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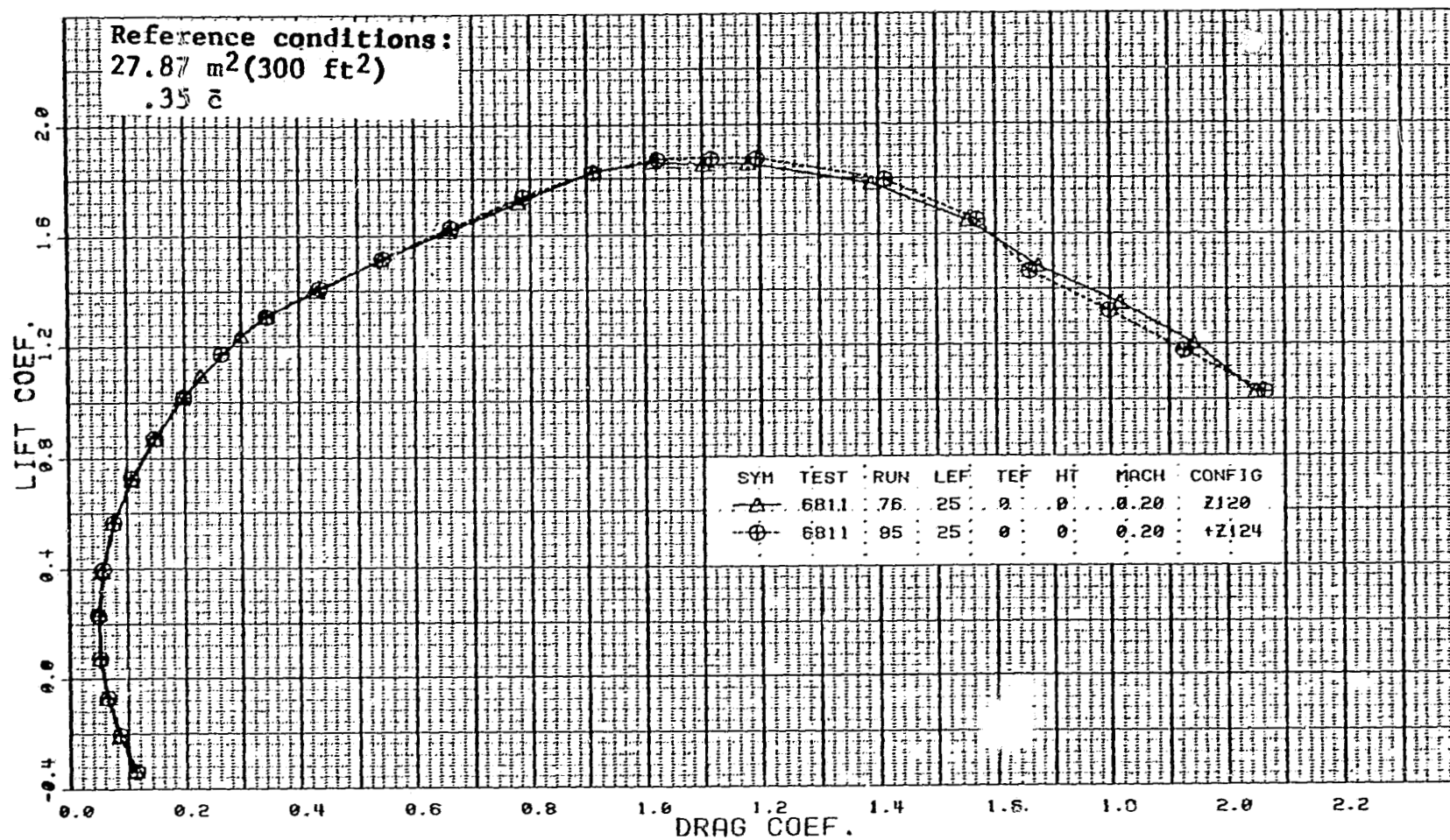


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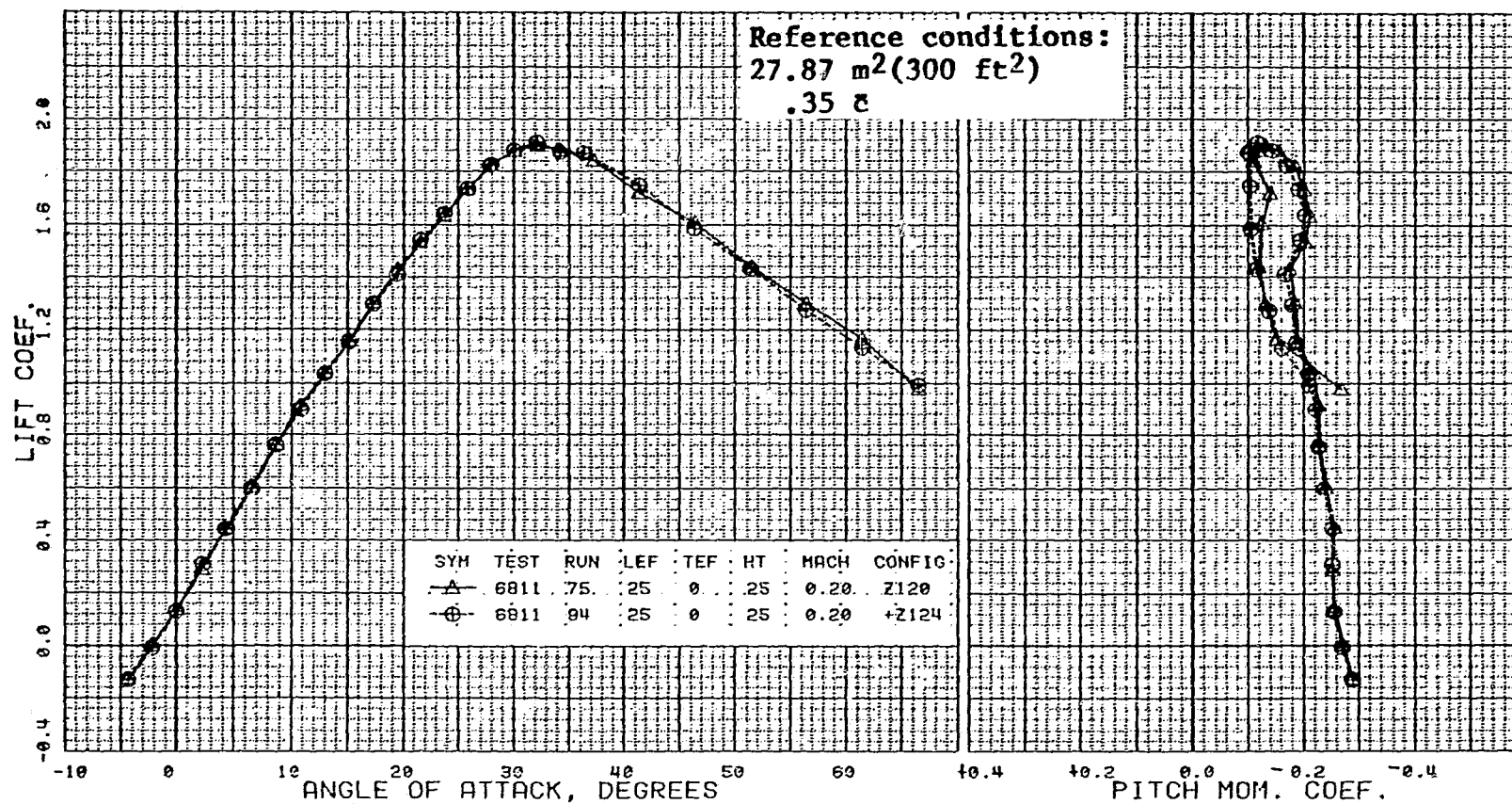


Figure 1-50 Effect of Nose Strake Z124, F-16, HT= +25°
 (a) Lift and Pitching Moment

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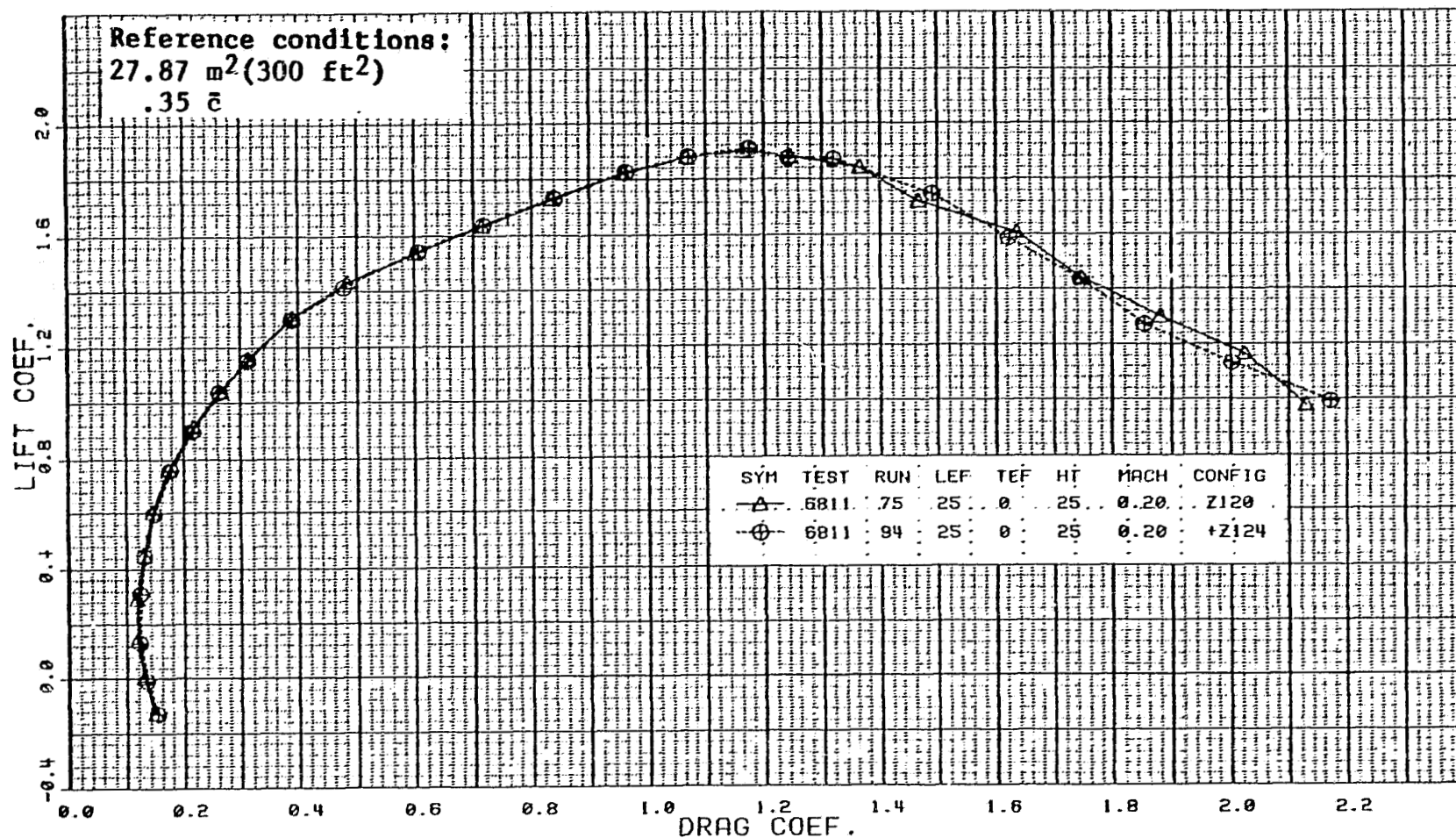


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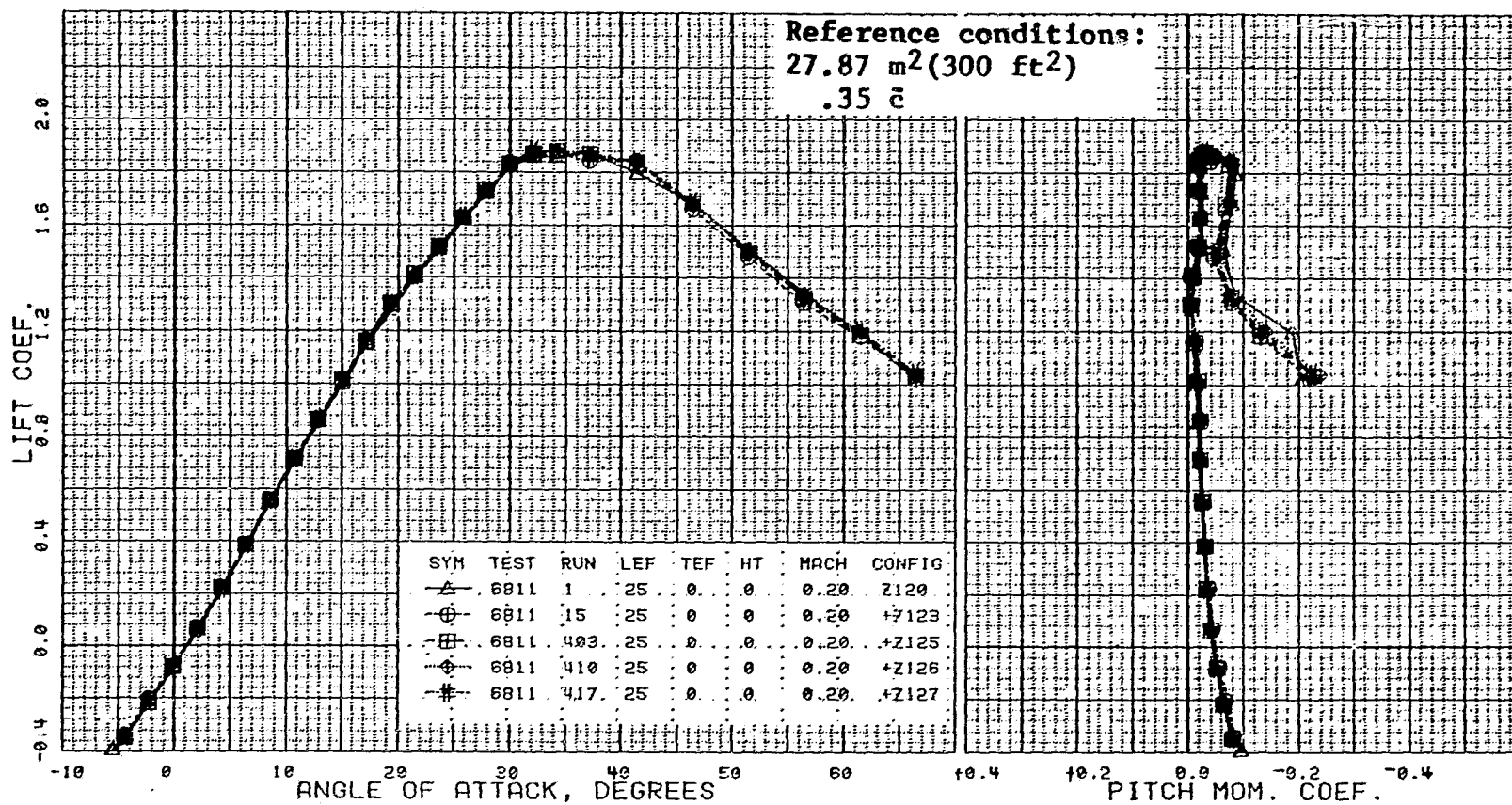


Figure 1-51 Effect of Nose Strakes Z123-Z127, F-16
 (a) Lift and Pitching Moment

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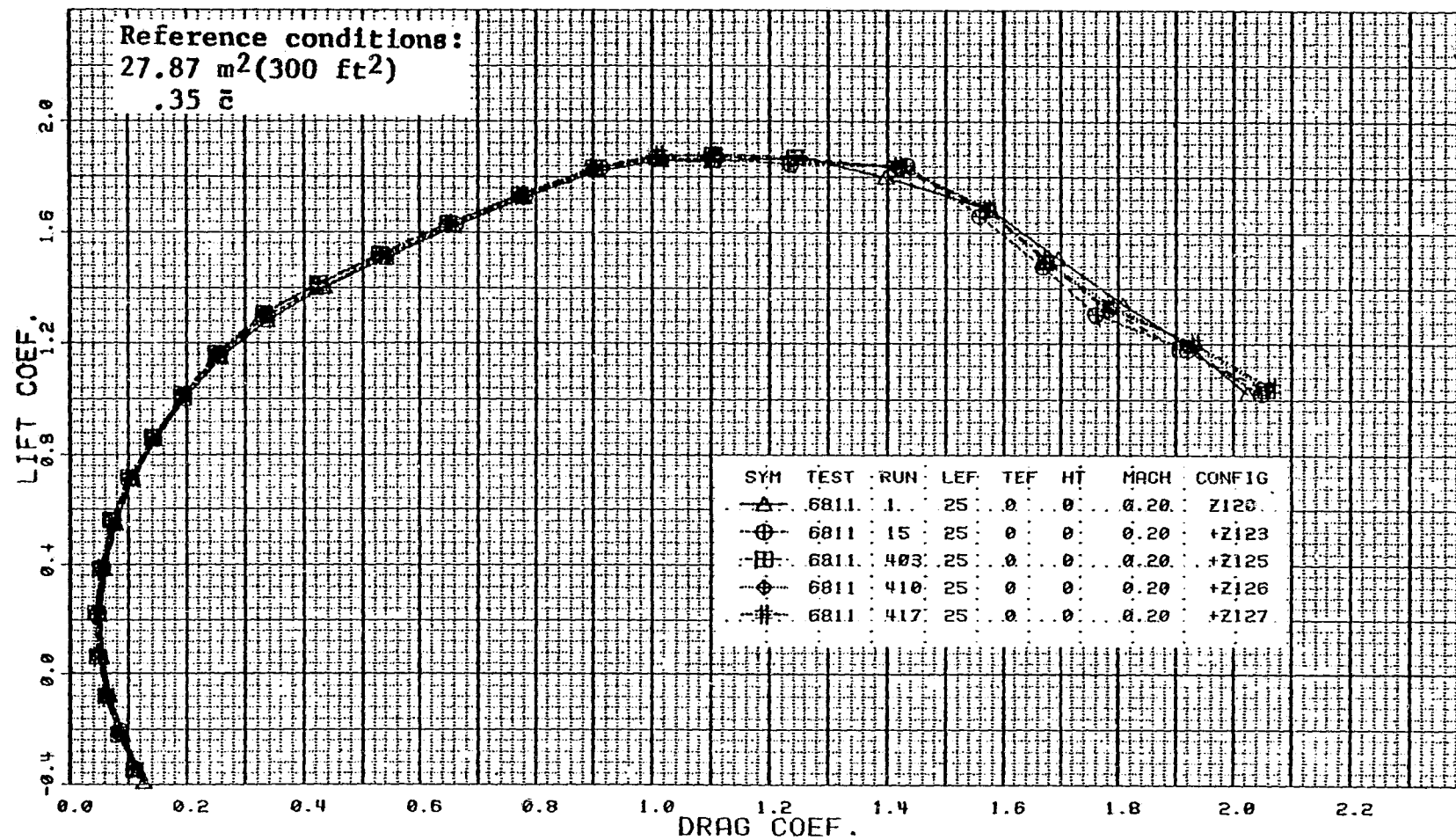


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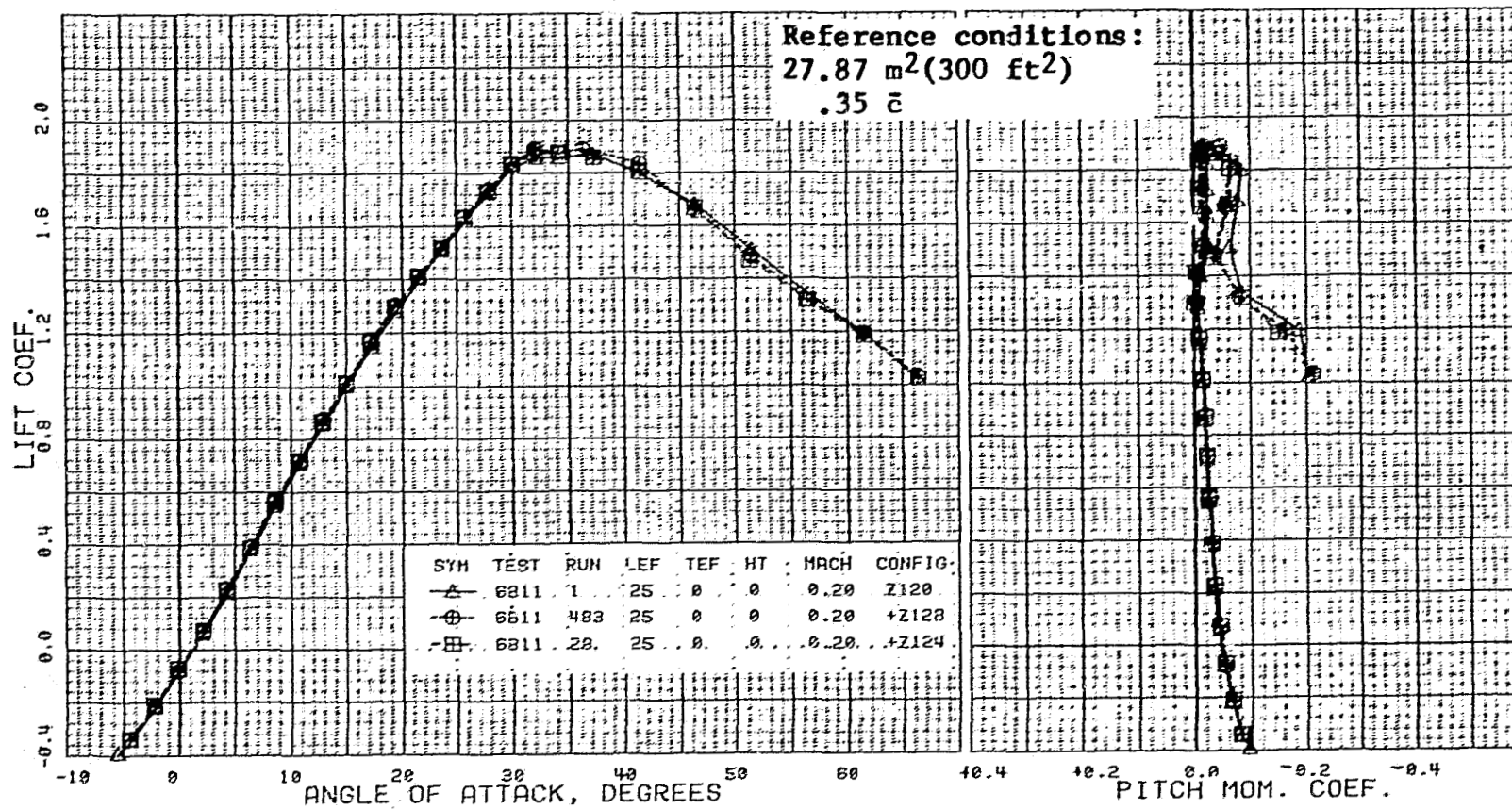


Figure 1-52 Effect of Nose Strake Inclination (Z124 and Z128), F-16
(a) Lift and Pitching Moment

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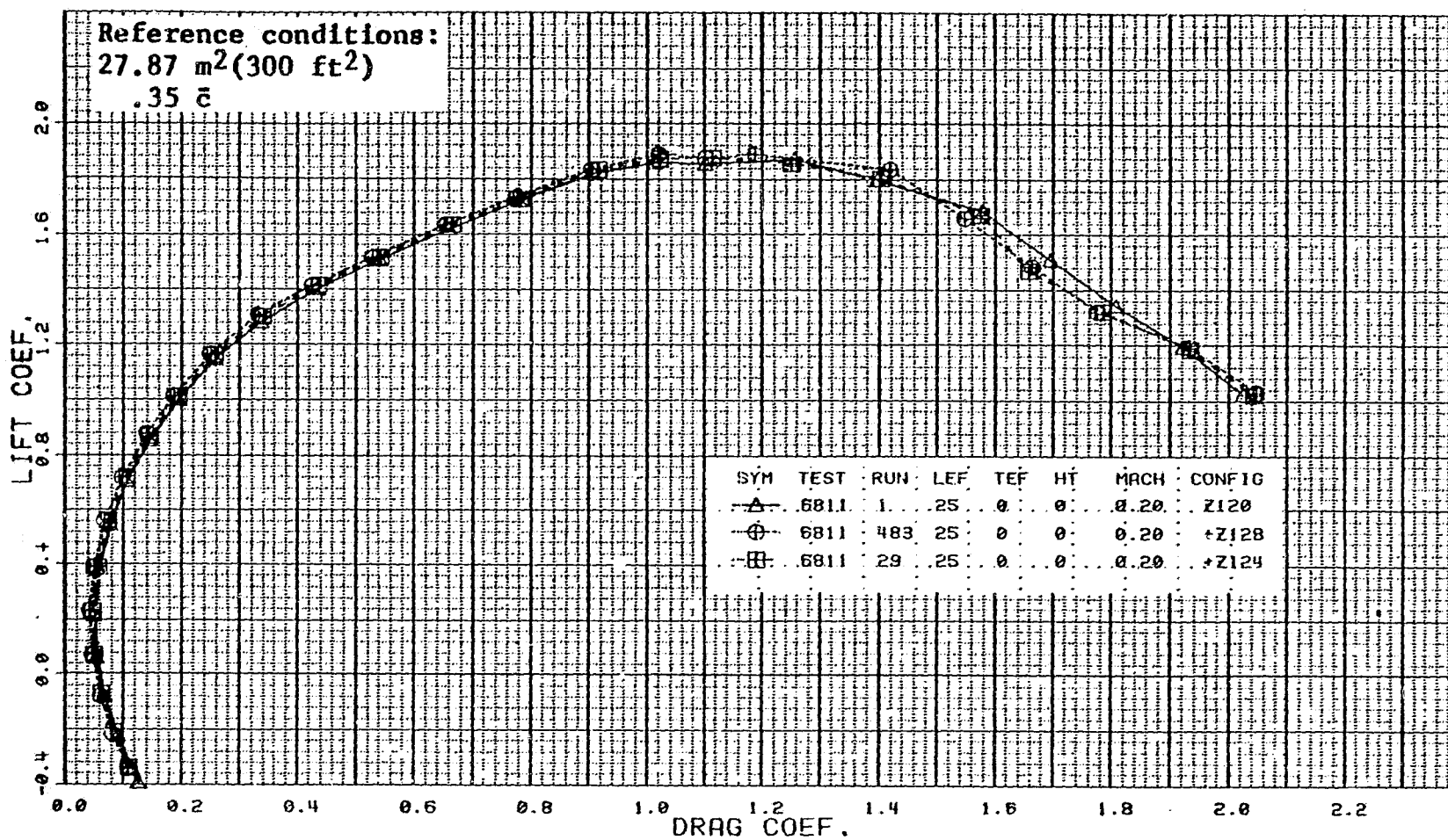


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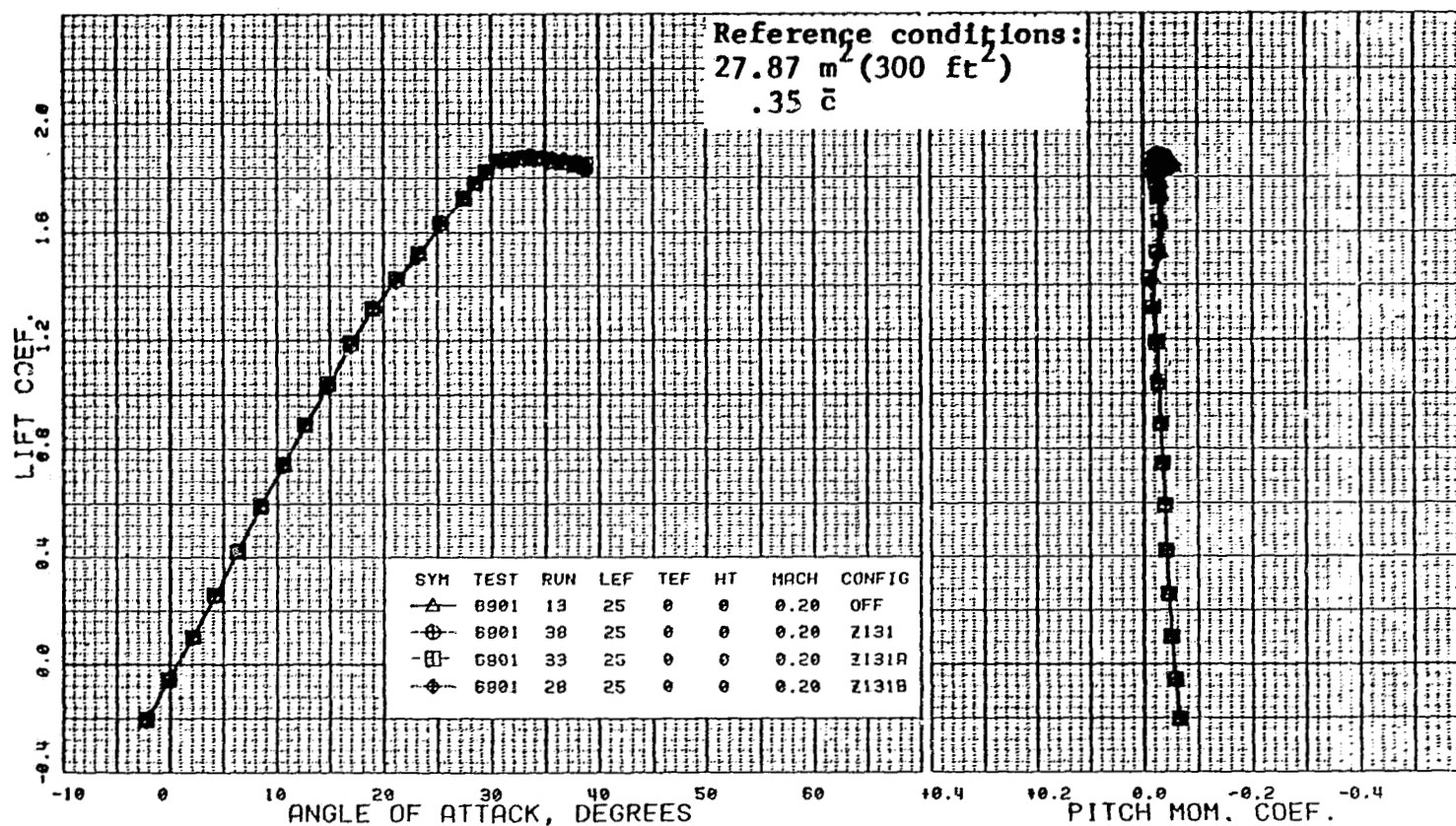


Figure 1-53 Effect of Nose Strake Length (Z131, Z131A and Z131B), F-16
 (a) Lift and Pitching Moment

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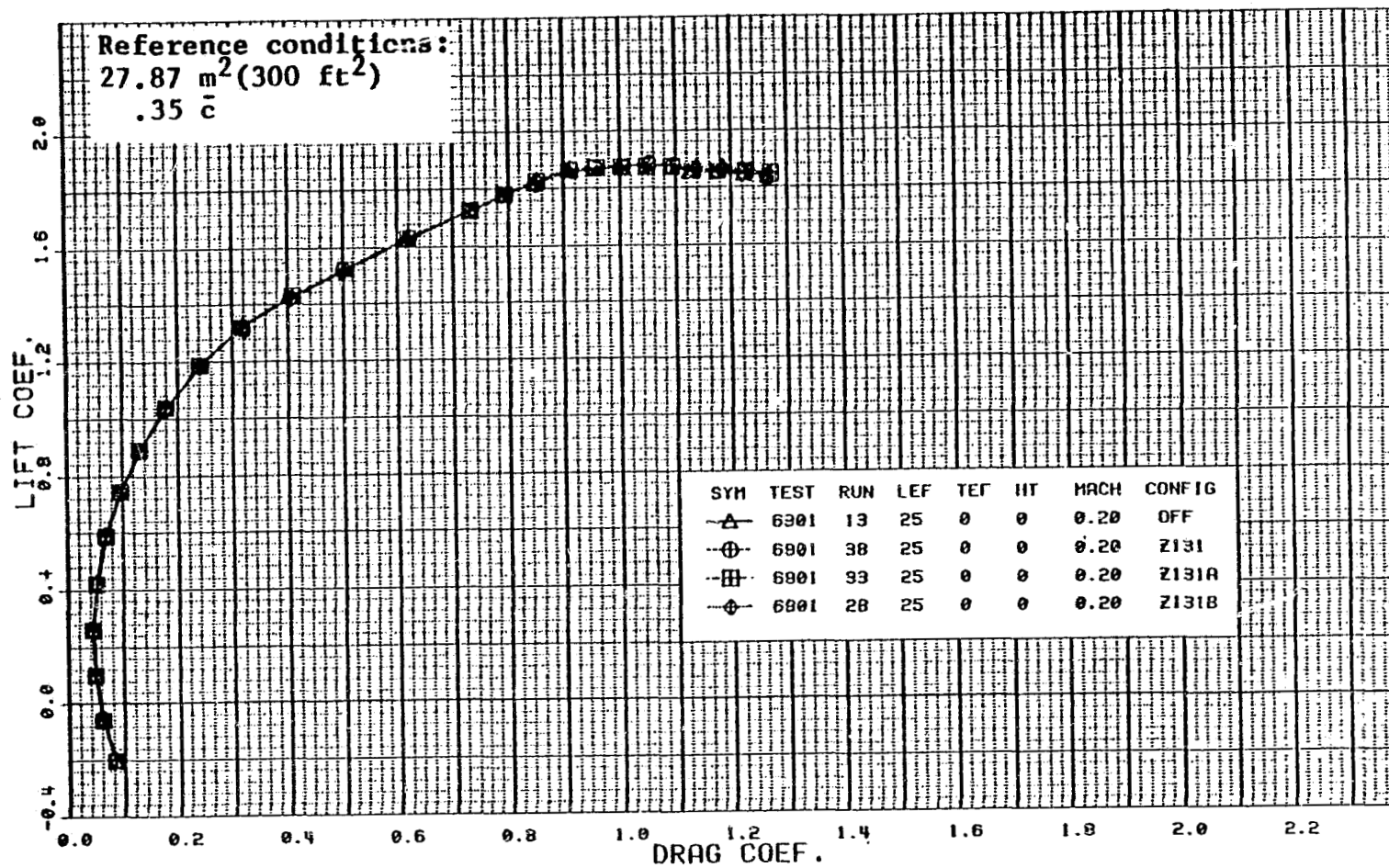


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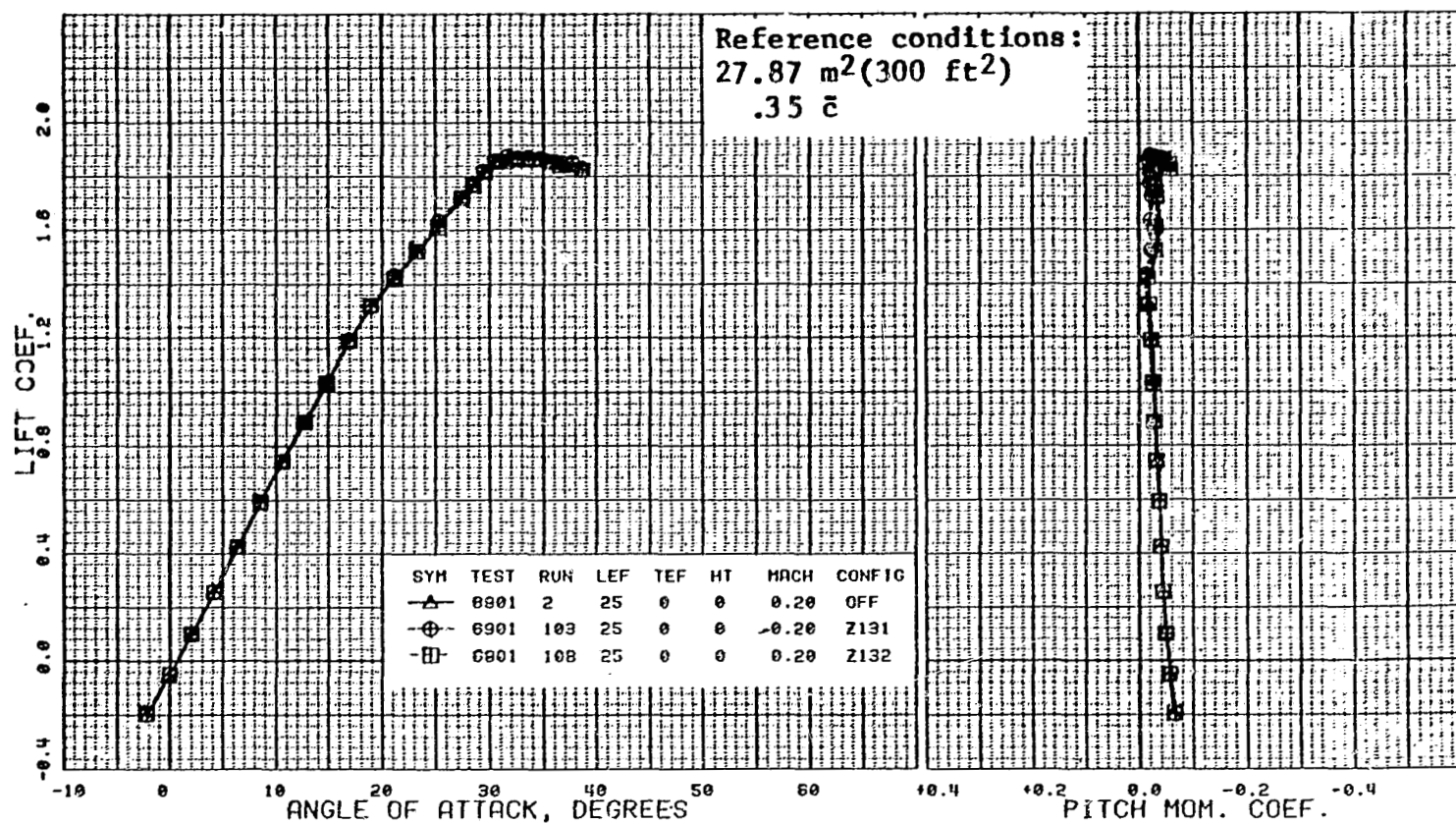


Figure 1-54 Effect of Nose Strakes Z131 and Z132, F-16
 (a) Lift and Pitching Moment

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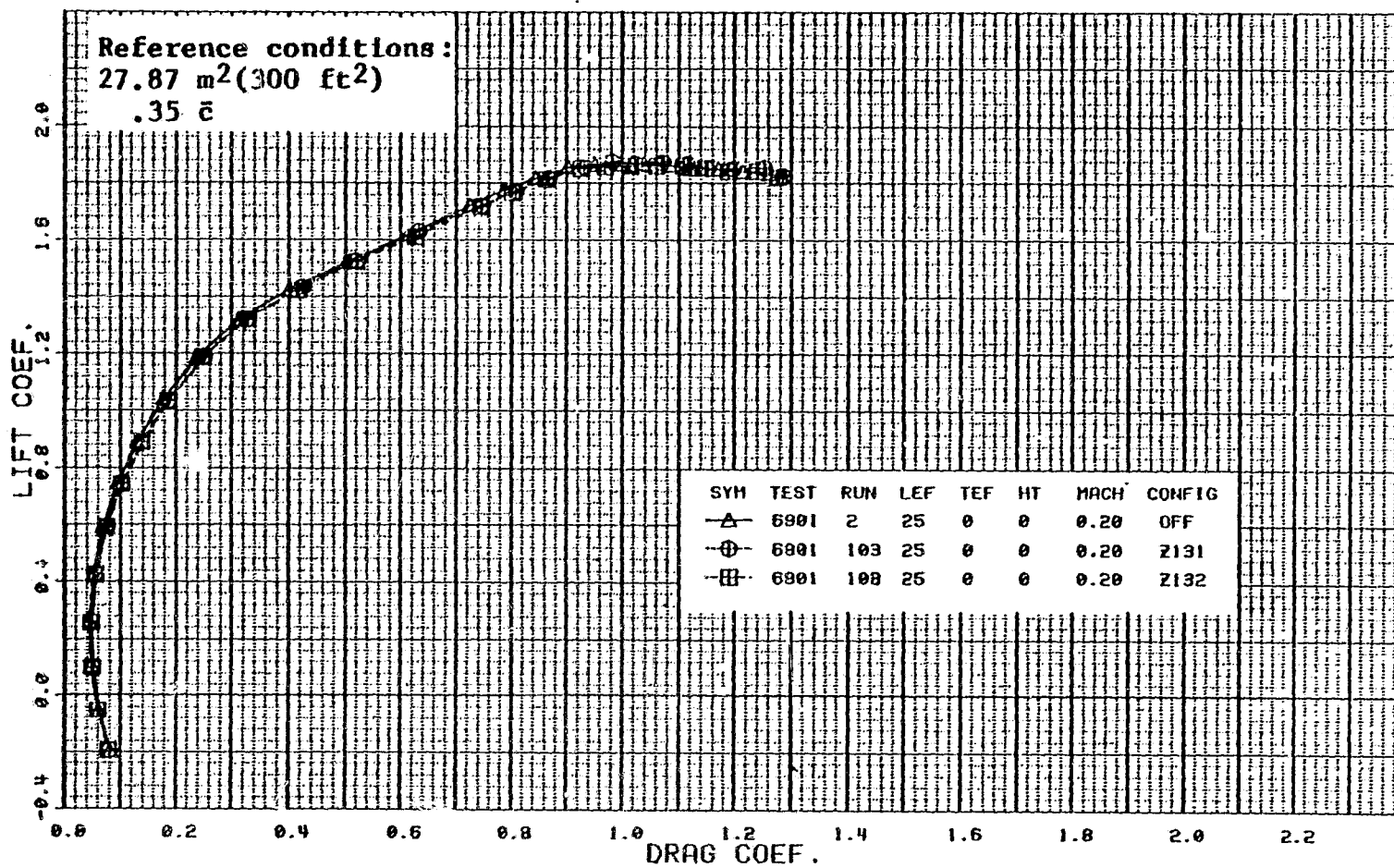


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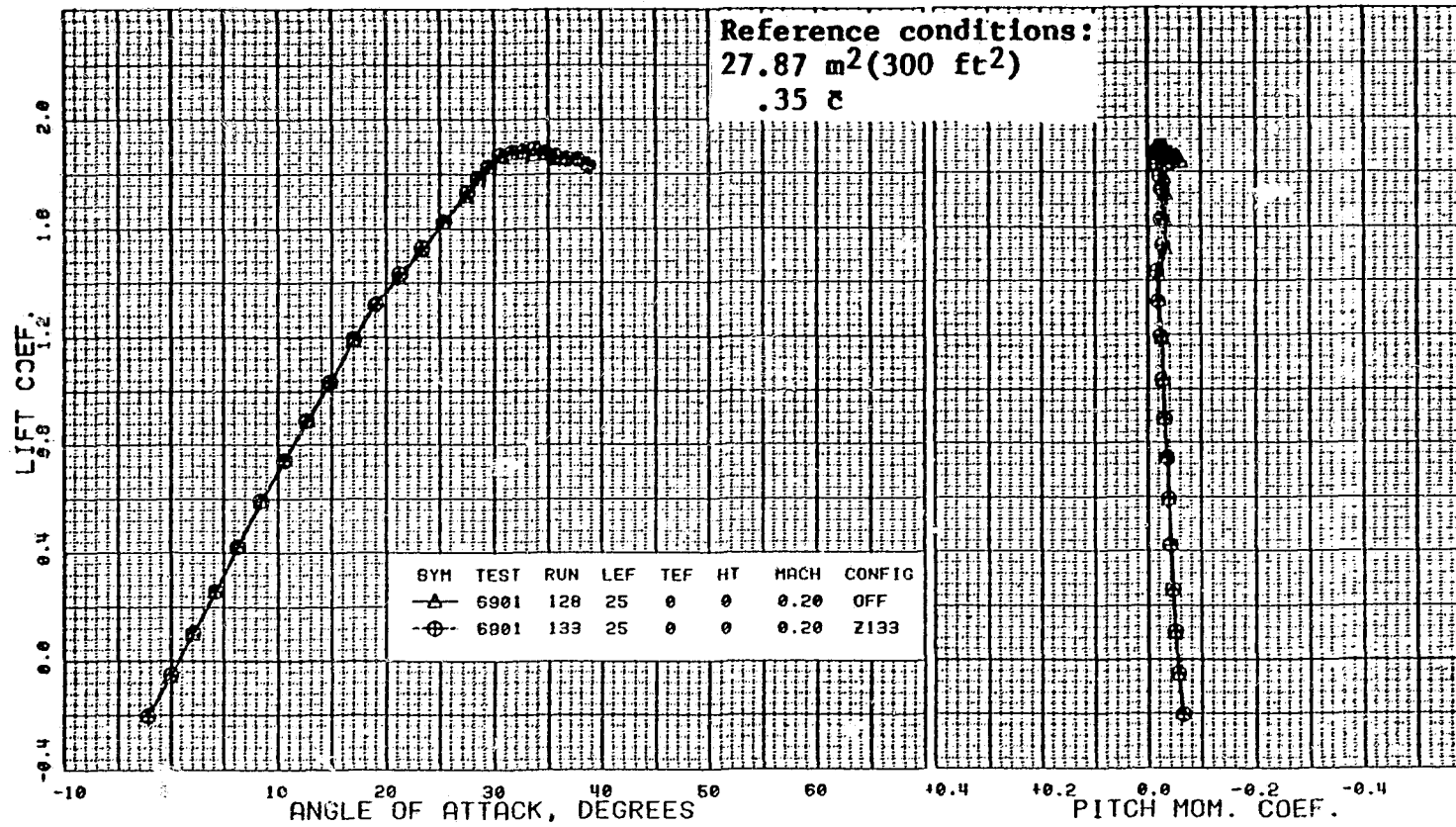


Figure 1-55 Effect of Nose Strake Z133, F-16
 (a) Lift and Pitching Moment

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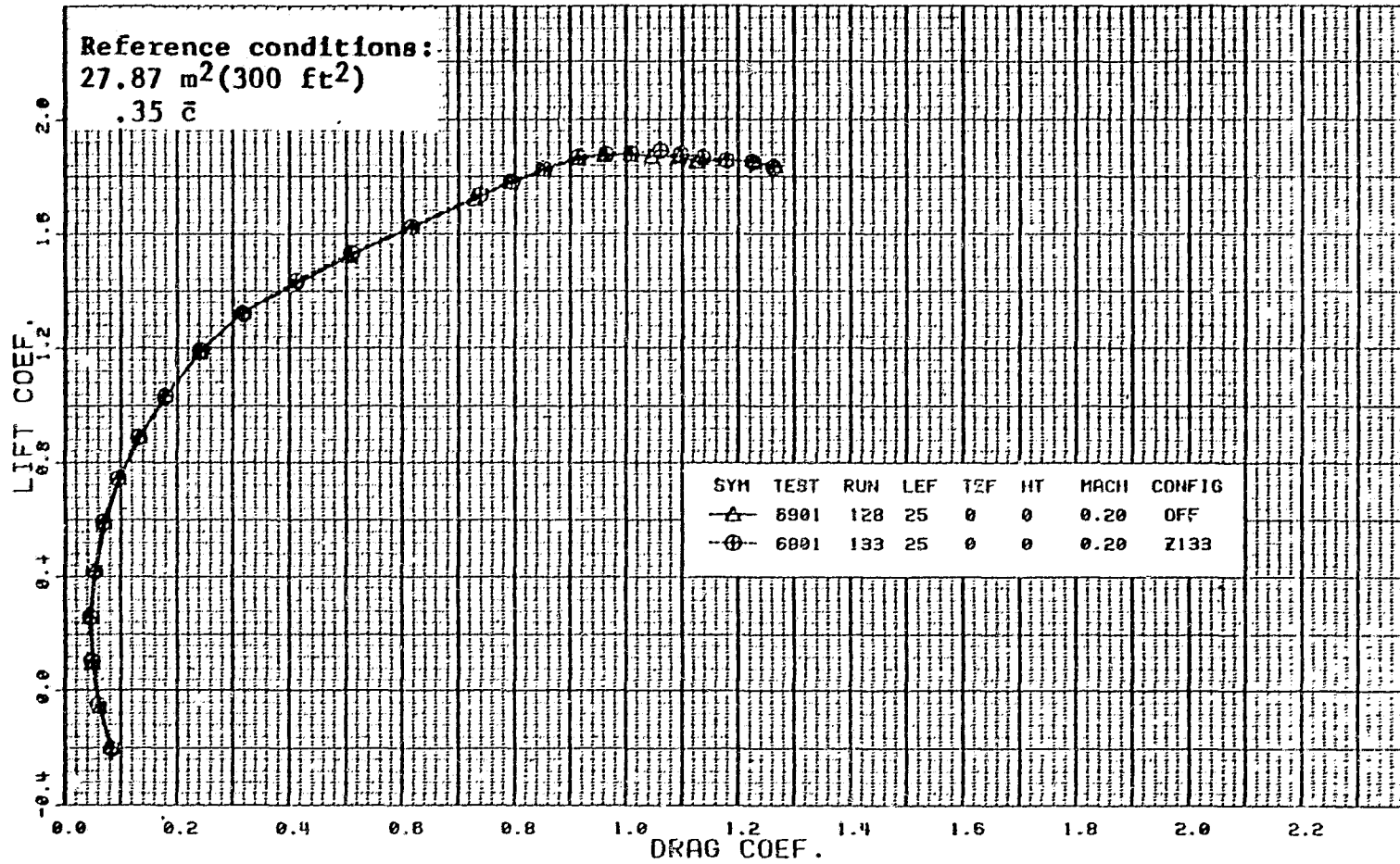


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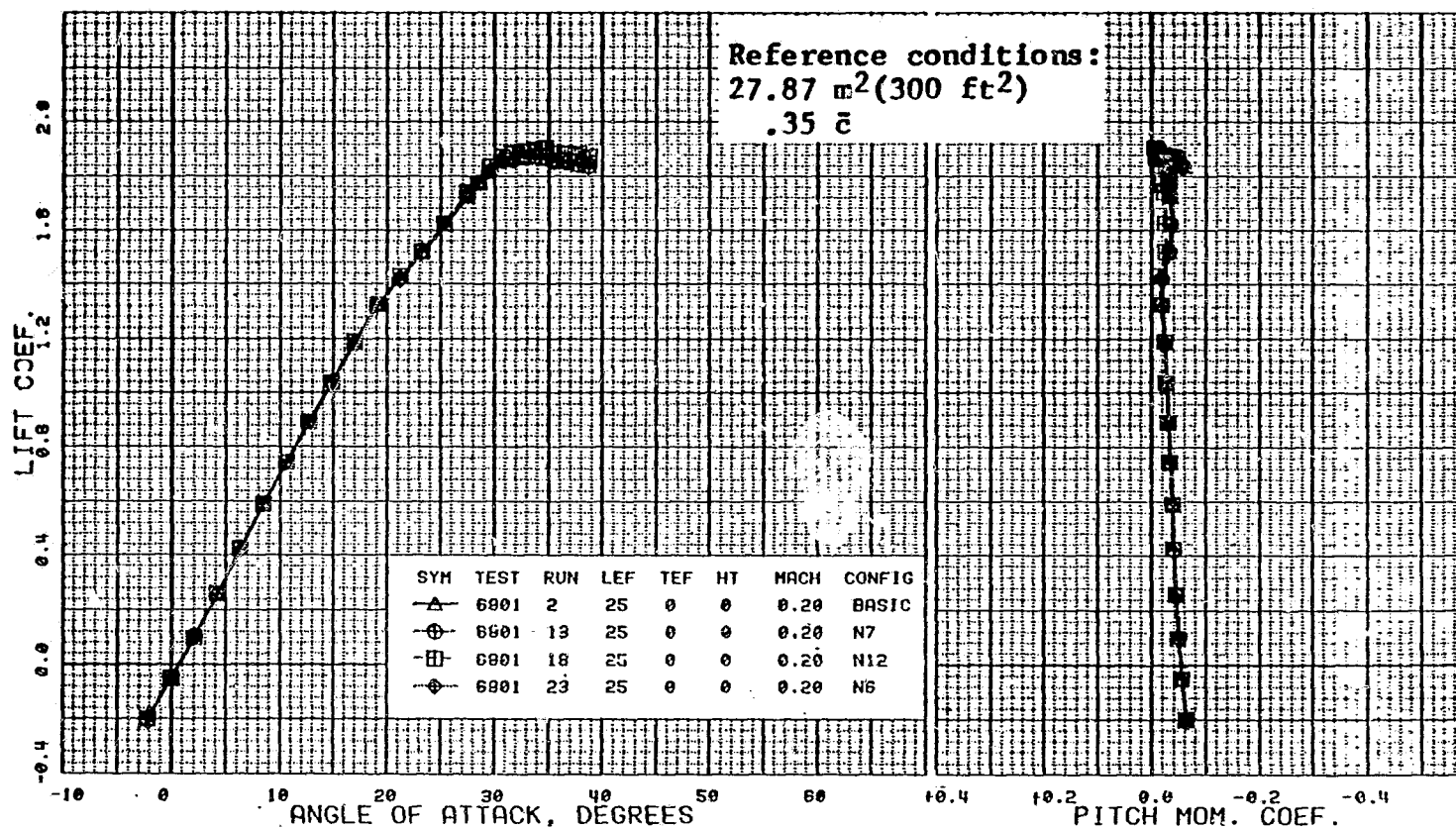


Figure 1-56 Effect of Nose Shape, F-16
 (a) Lift and Pitching Moment

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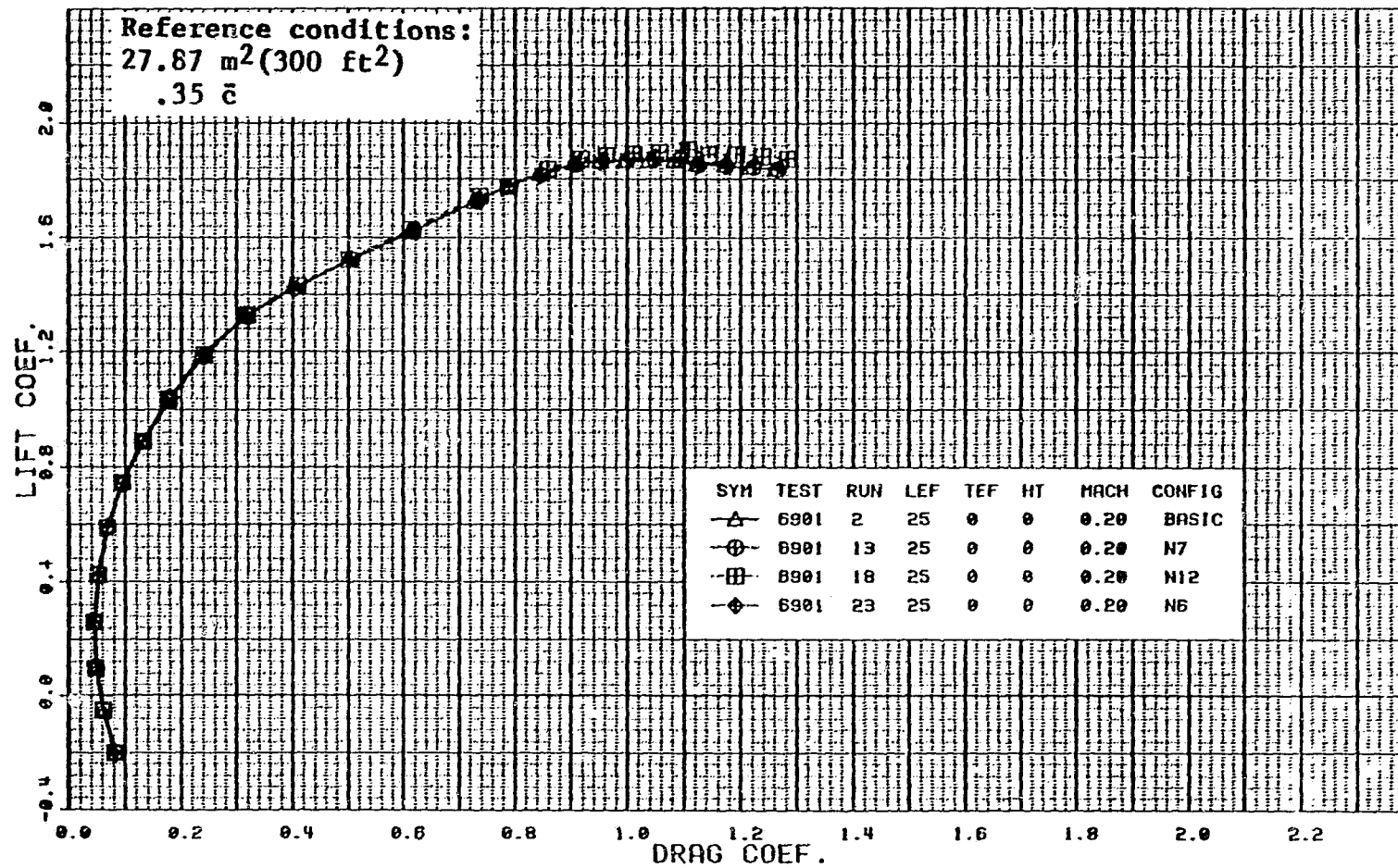


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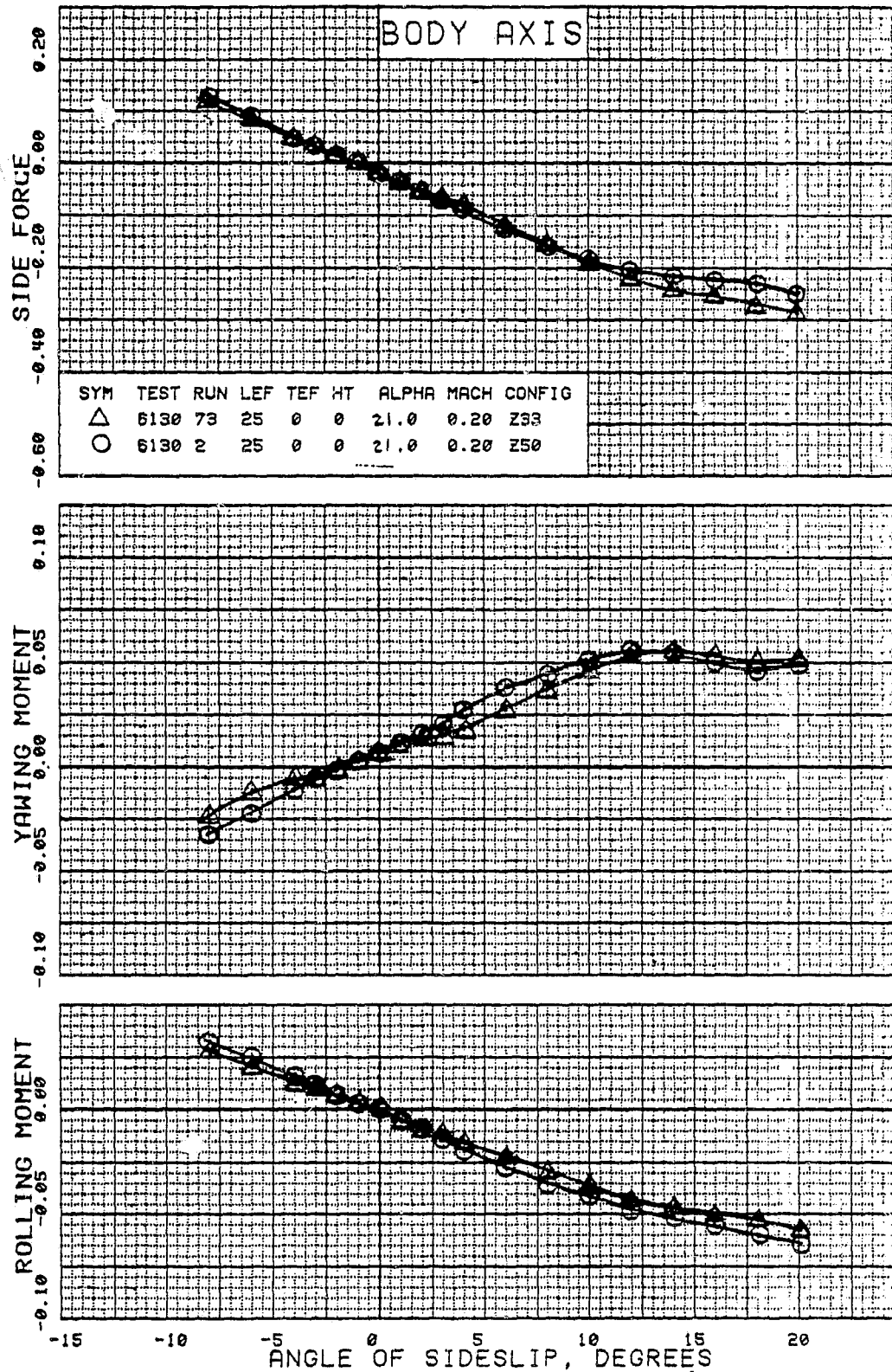


Figure 2-1 Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16
(a) Force and Moments, $\alpha = 21^\circ$

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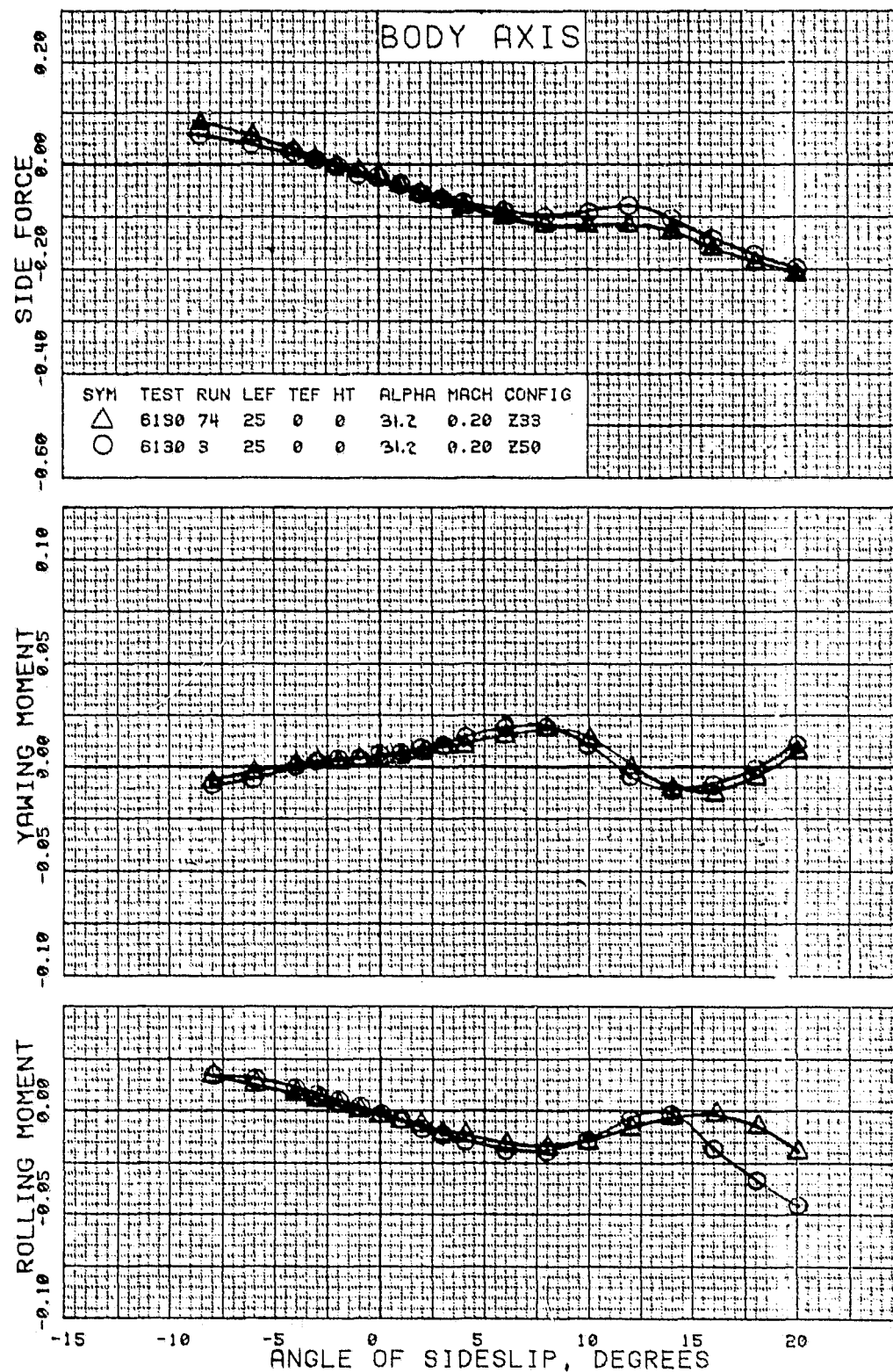


Figure 2-1 (b) Force and Moments, $\alpha = 31^\circ$

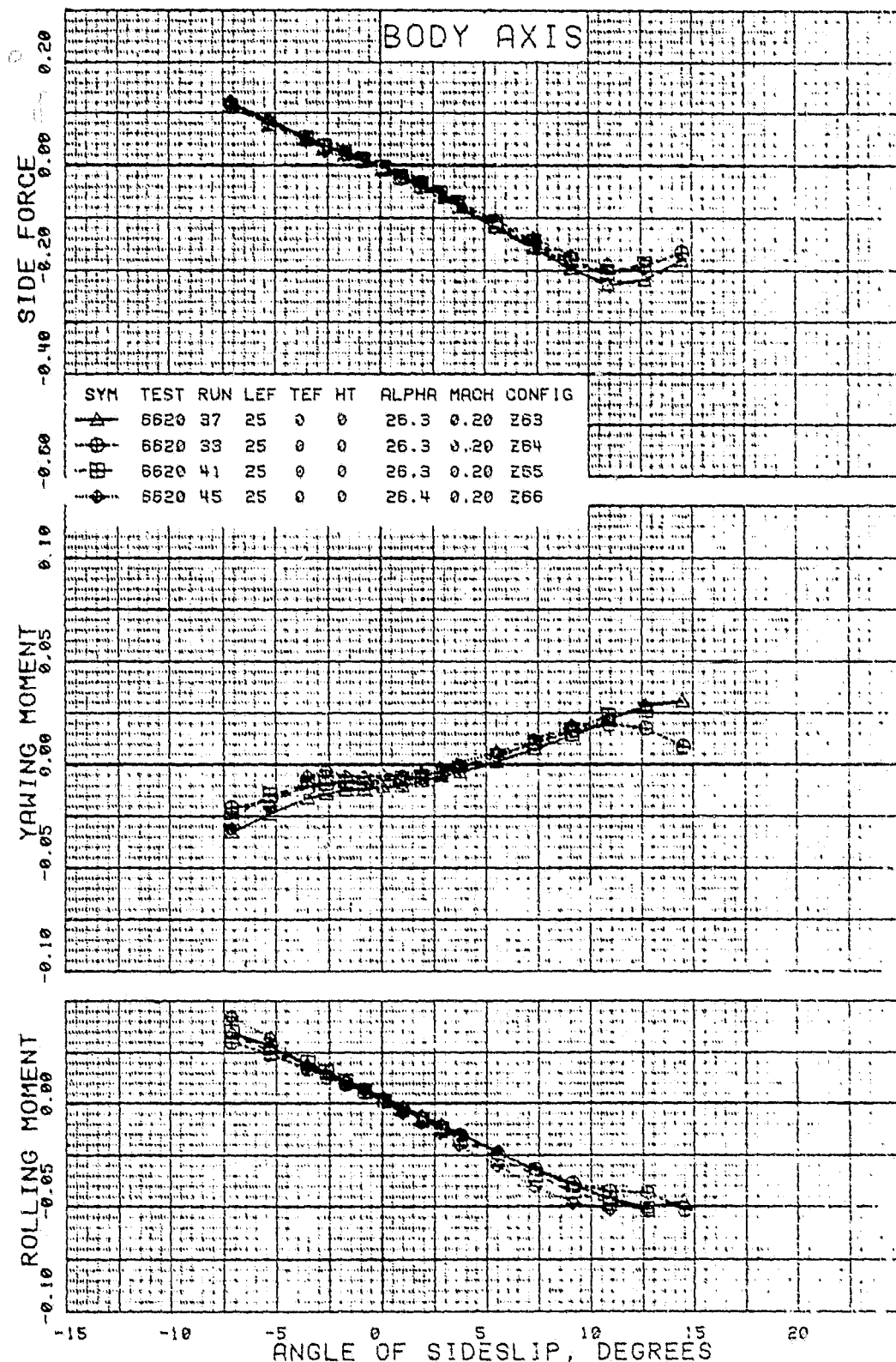


Figure 2-2 Effect of Forebody Strakes Z63-Z66, YF-16
+ 30.5 Stretch
(a) Force and Moments, $\alpha=26^\circ$

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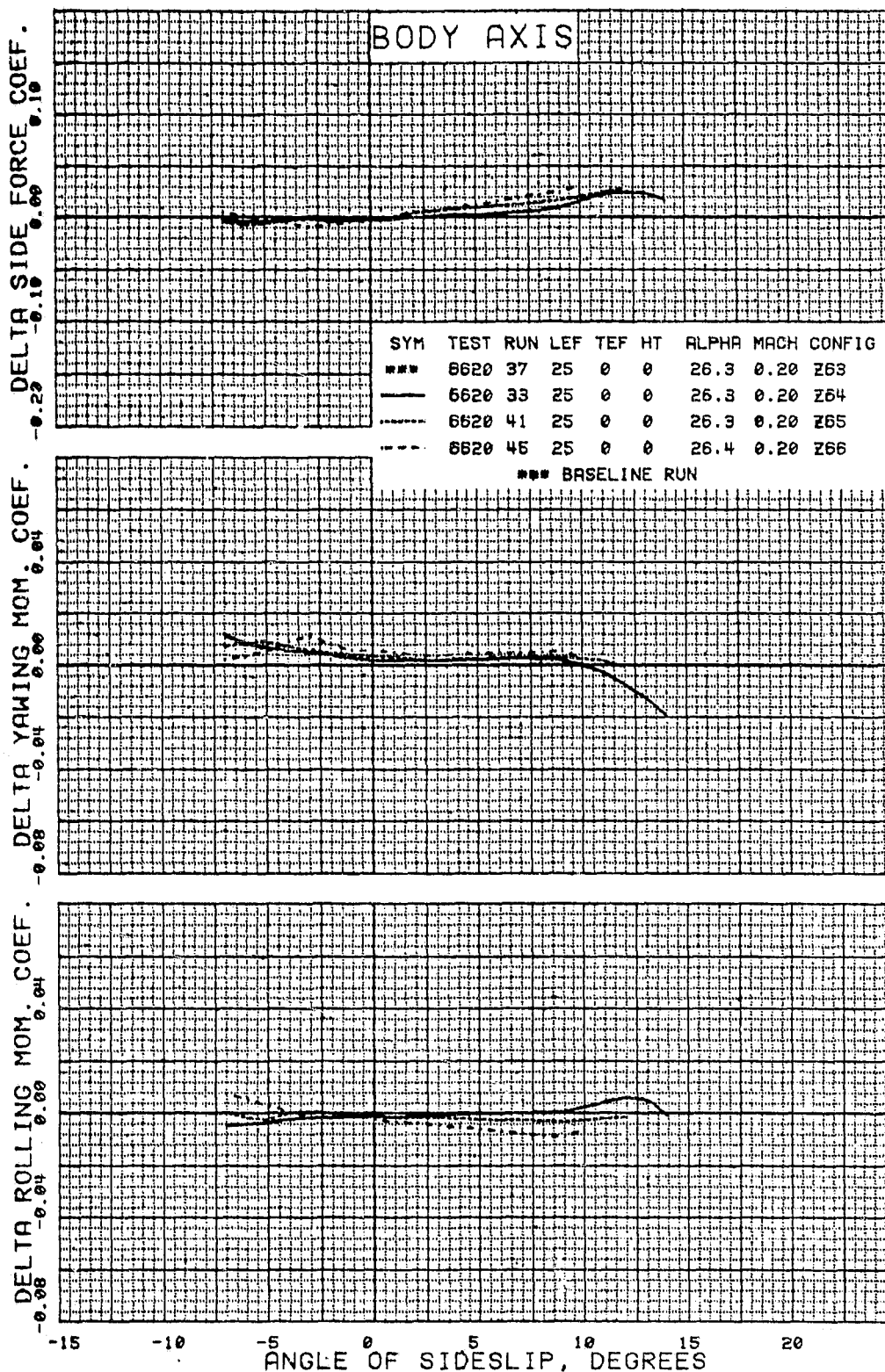


Figure 2-2 (b) Increments, $\alpha = 26^\circ$

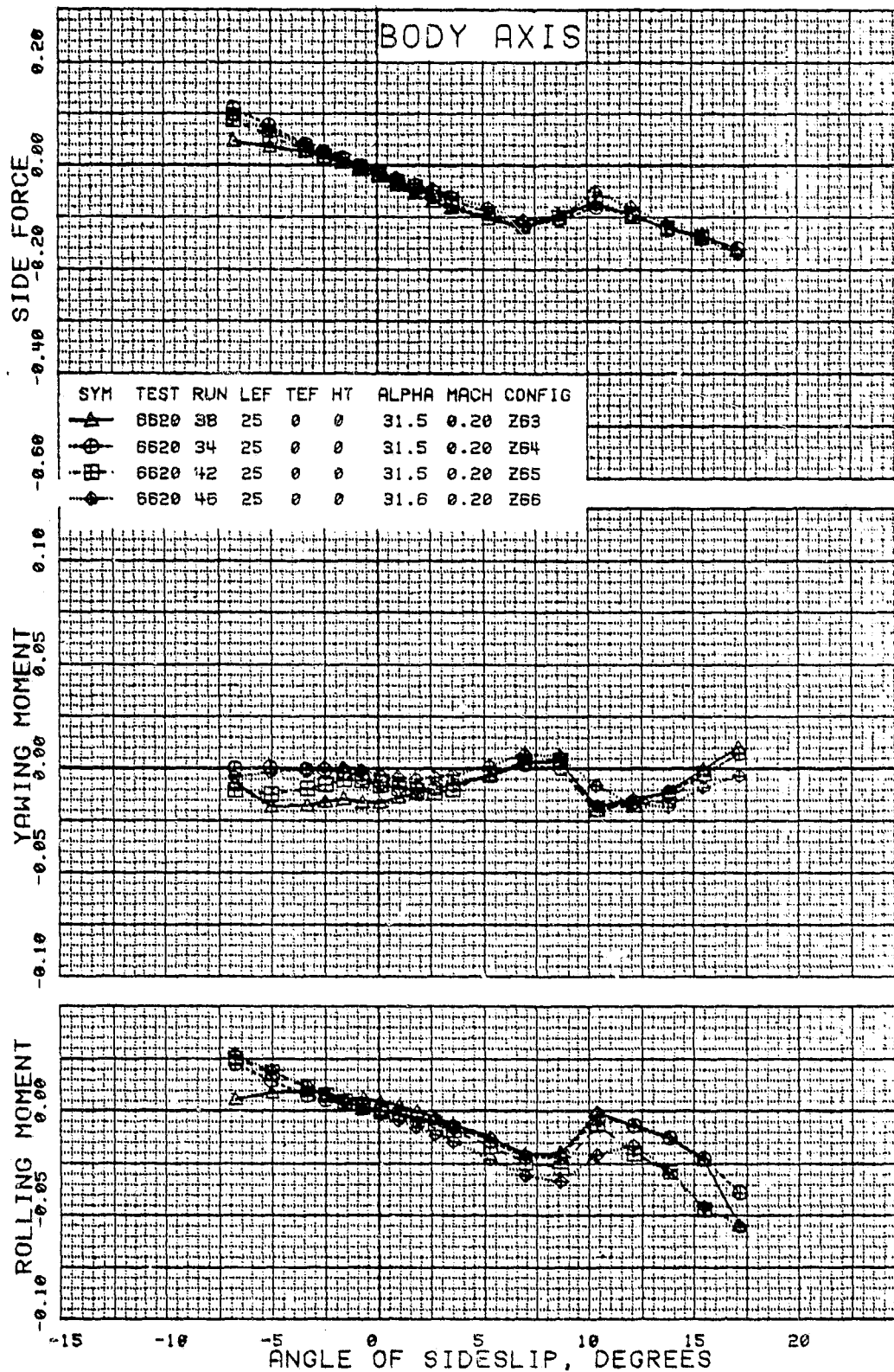


Figure 2-2 (c) Force and Moments, $\alpha = 32^\circ$

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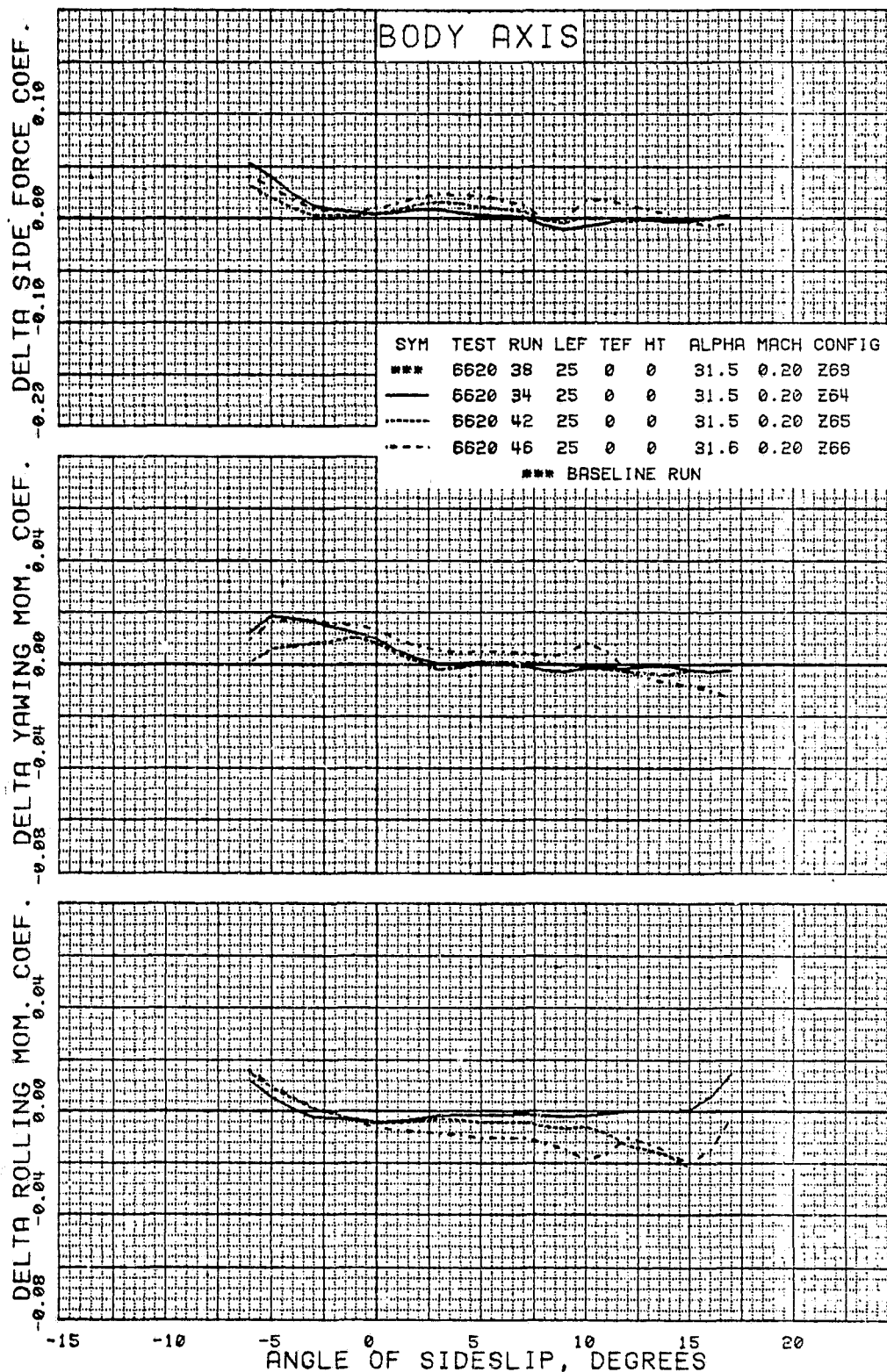


Figure 2-2 (d) Increments, $\alpha = 32^\circ$

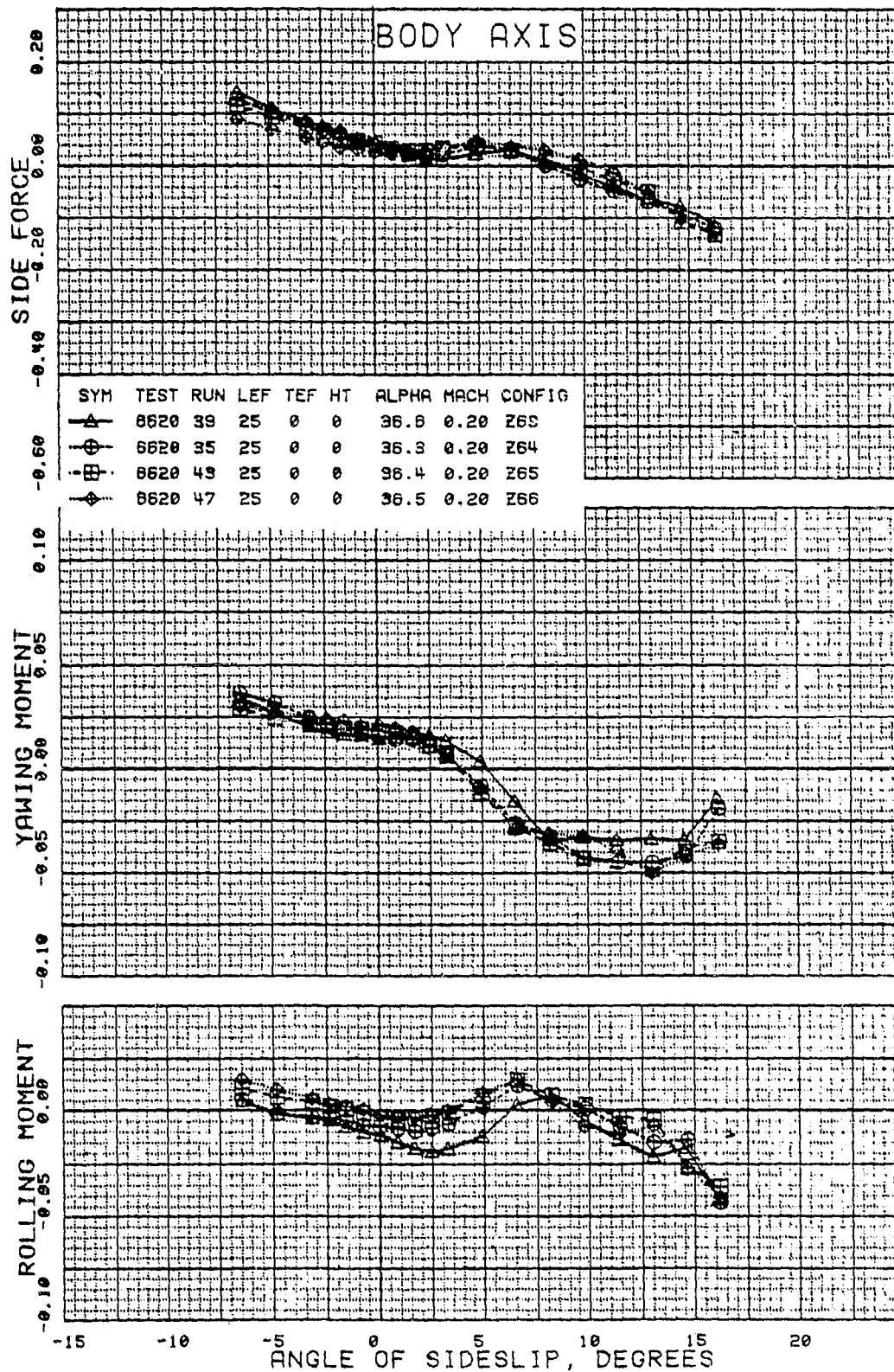


Figure 2-2 (e) Force and Moments, $\alpha = 36^\circ$

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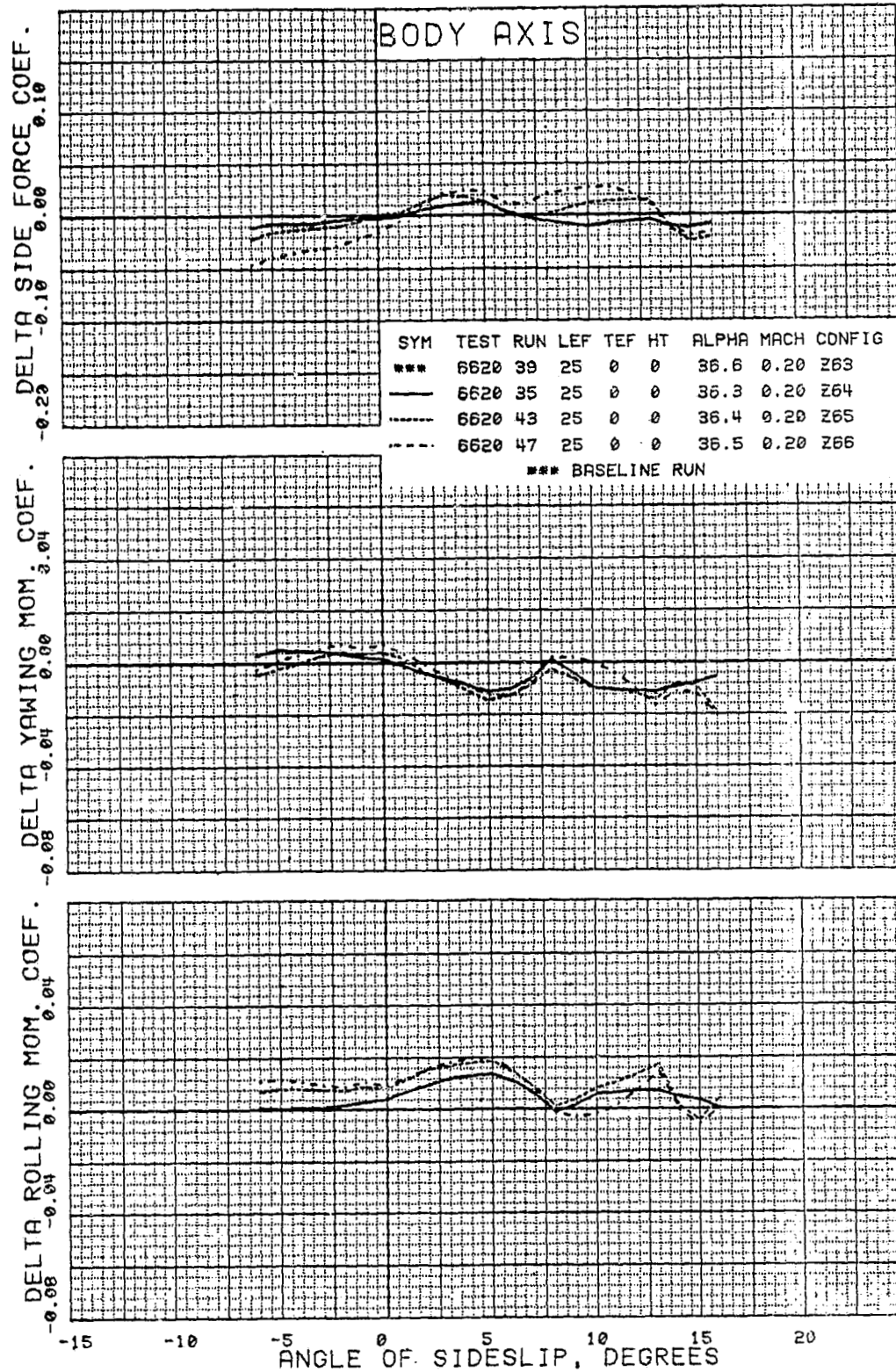


Figure 2-2 (f) Increments, $\alpha = 36^\circ$

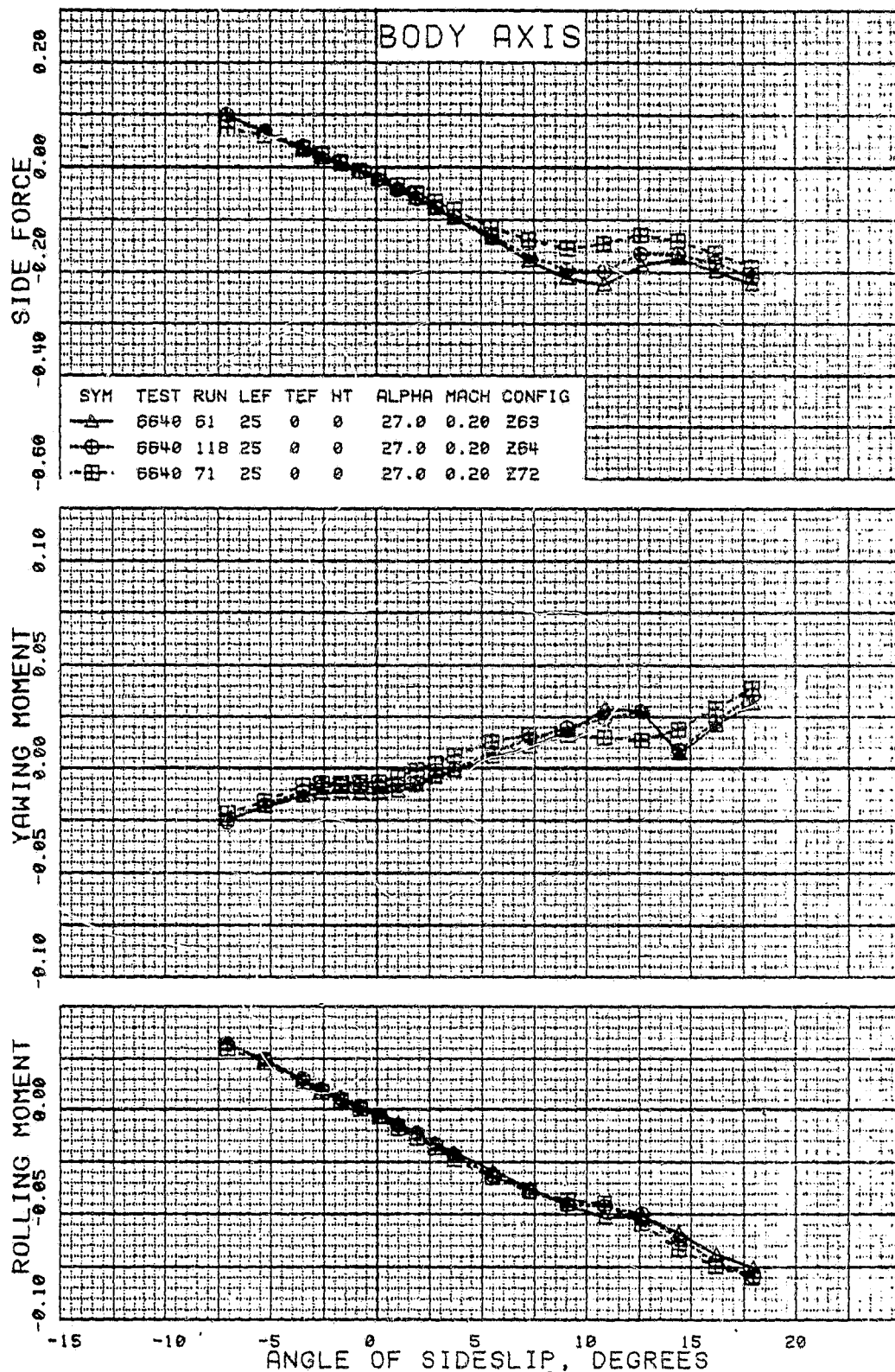


Figure 2-3 Effect of Forebody Strake Forward Extent (Z63,Z64,Z72), YF-16 + 30.5 Stretch
(a) Force and Moments, $\alpha = 27^\circ$

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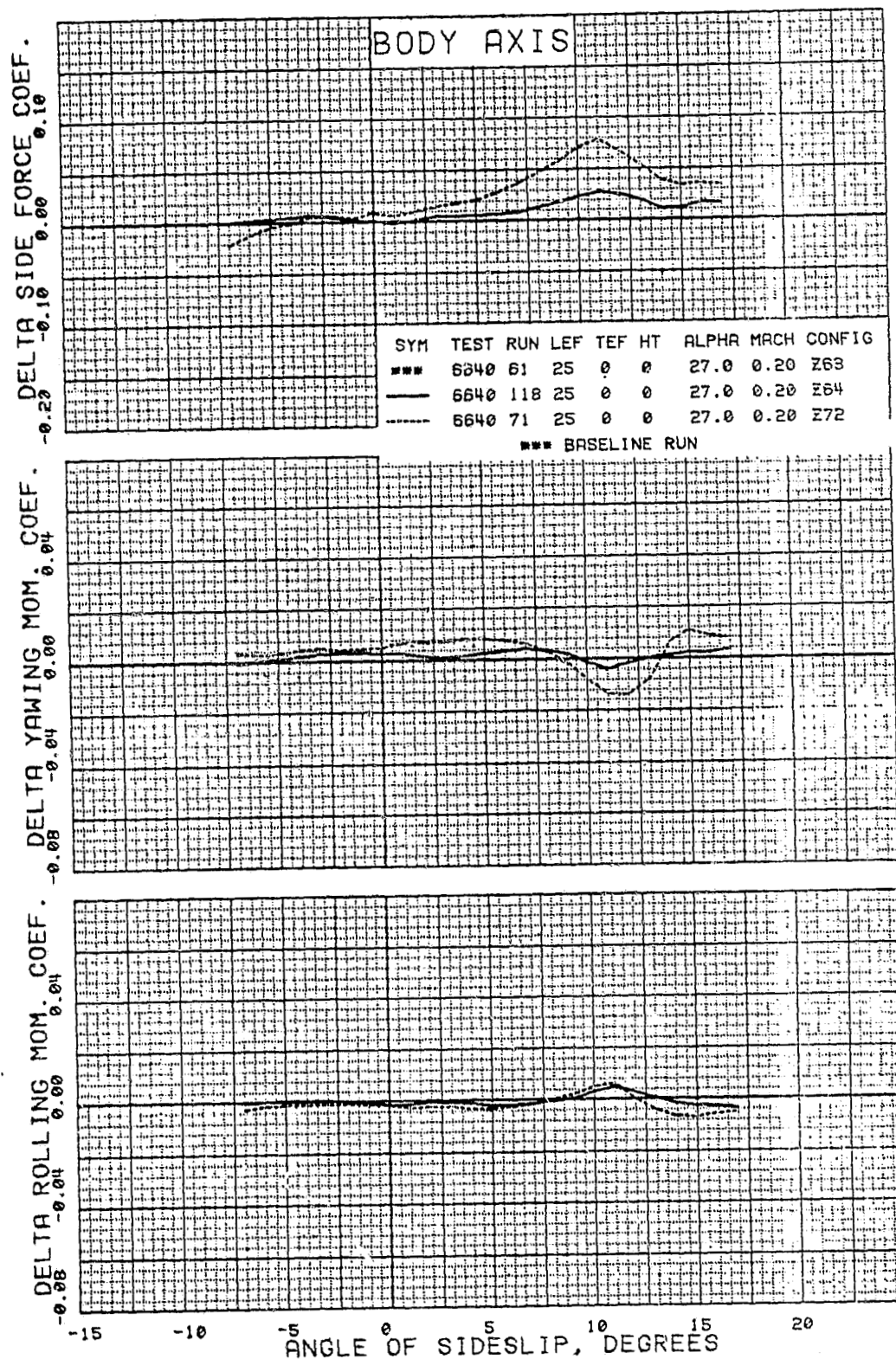


Figure 2-3 (b) Increments, $\alpha = 27^\circ$

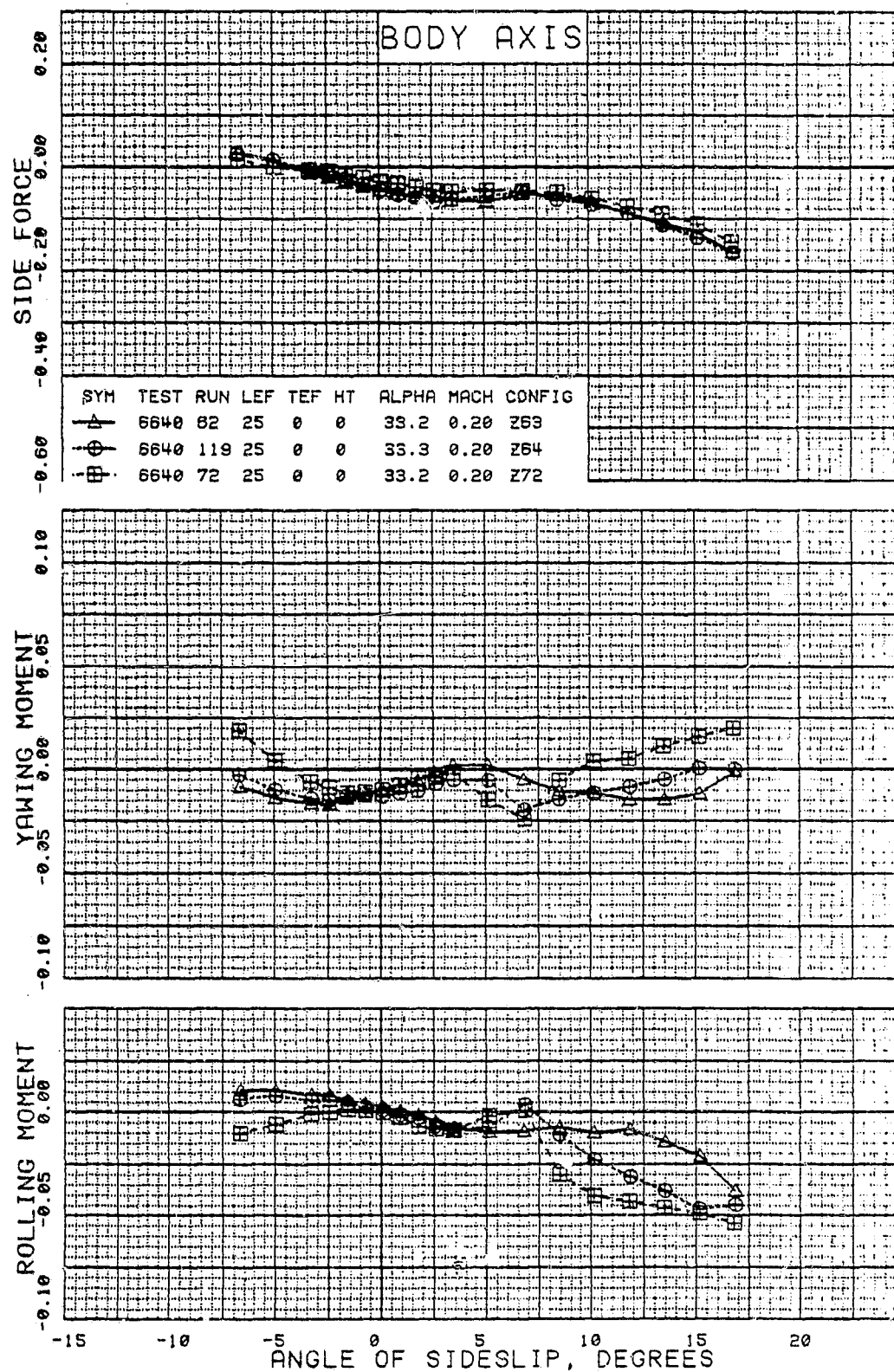


Figure 2-3 (c) Force and Moments, $\alpha = 33^\circ$

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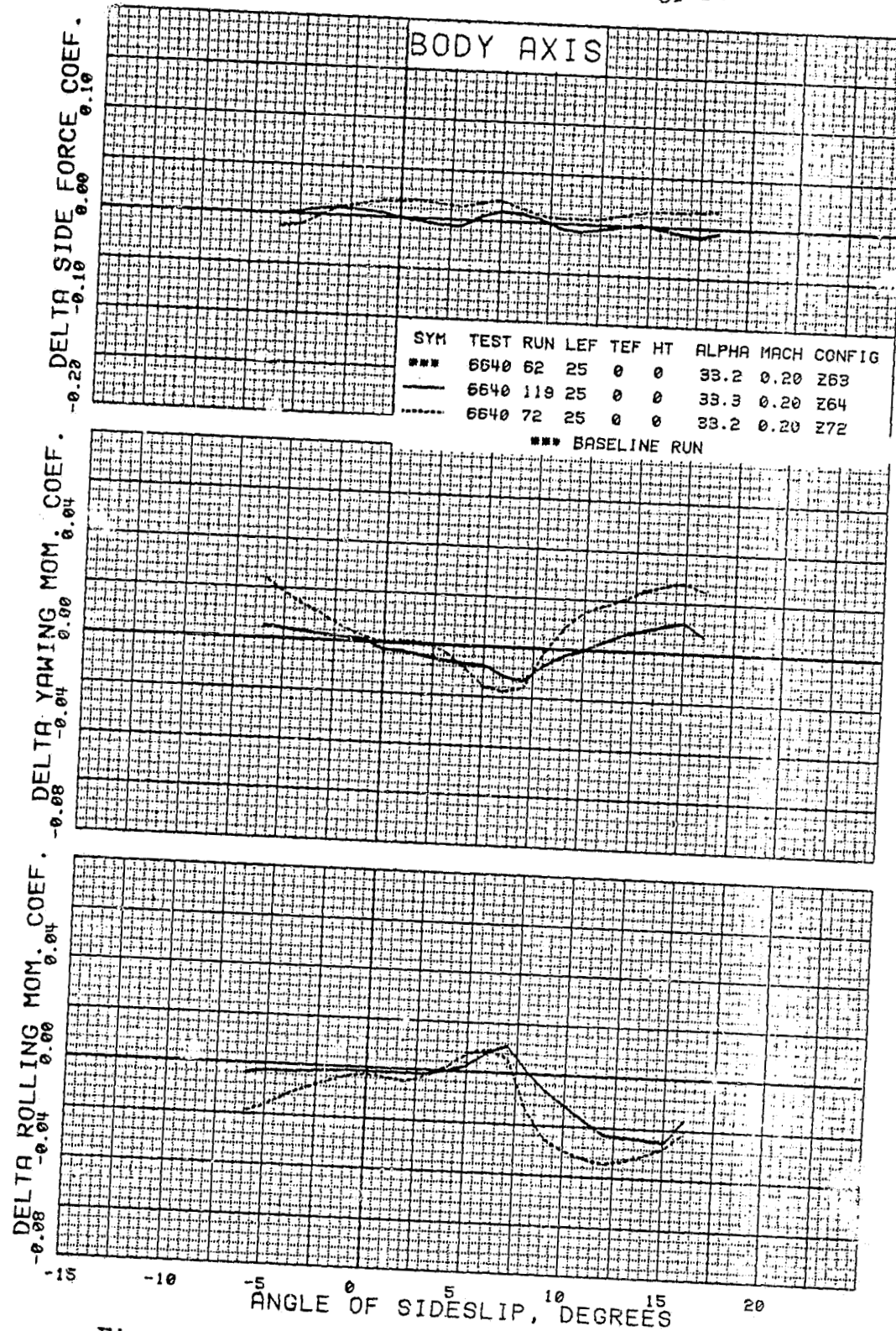


Figure 2-3 (d) Increments, $\alpha = 33^\circ$

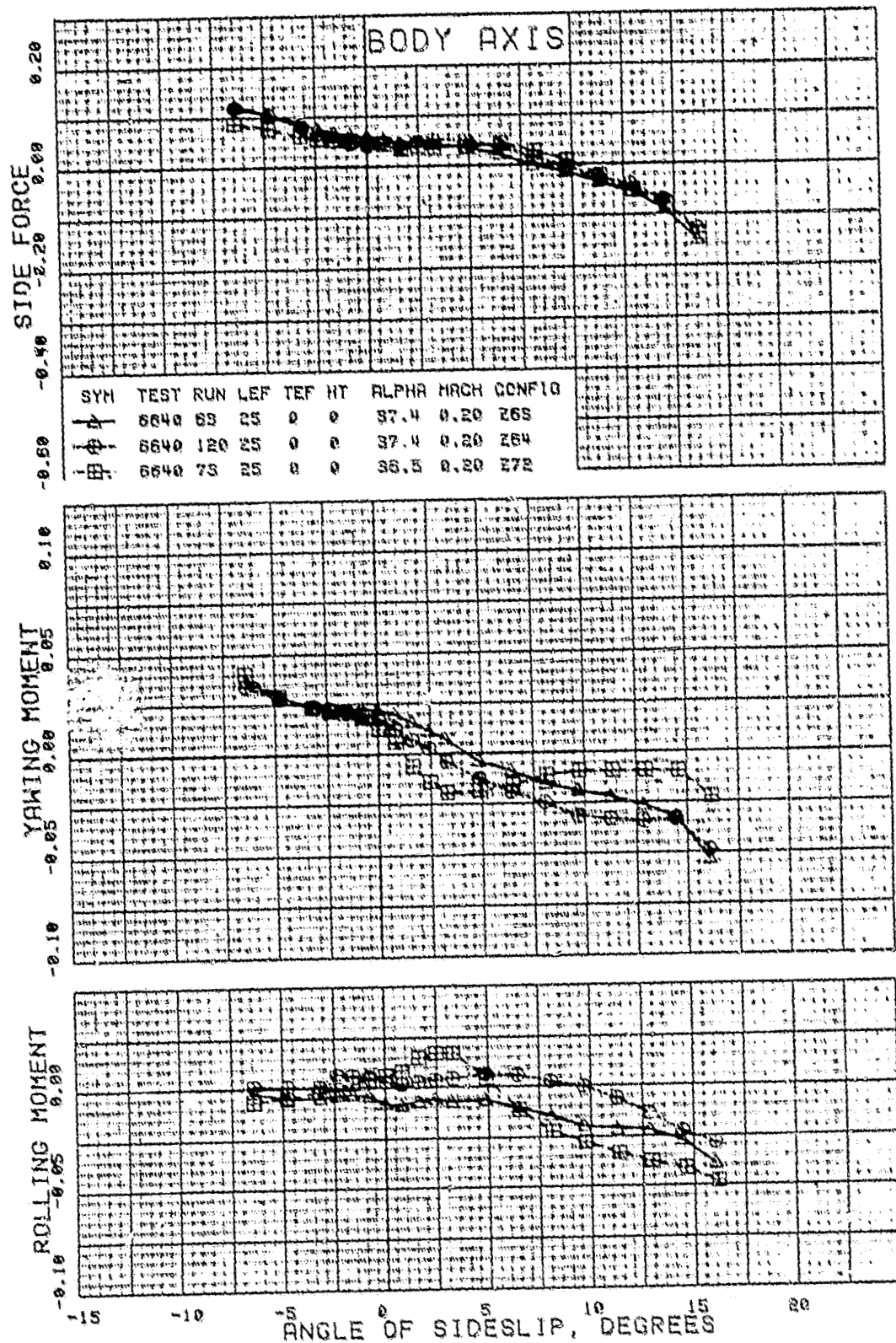


Figure 2-3 (e) Force and Moments, $\alpha = 37^\circ$

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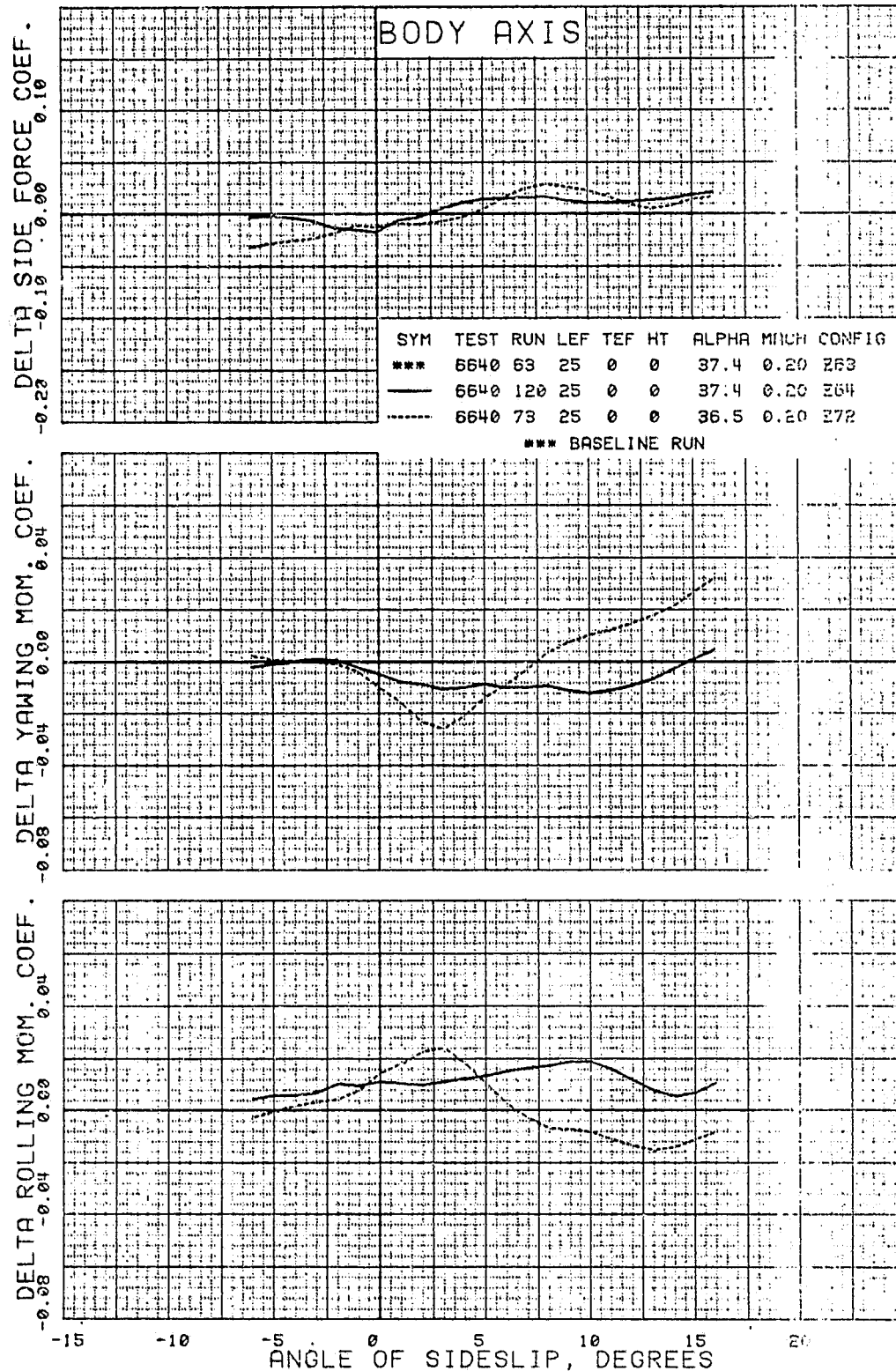


Figure 2-3 (f) Increments, $\alpha = 37^\circ$

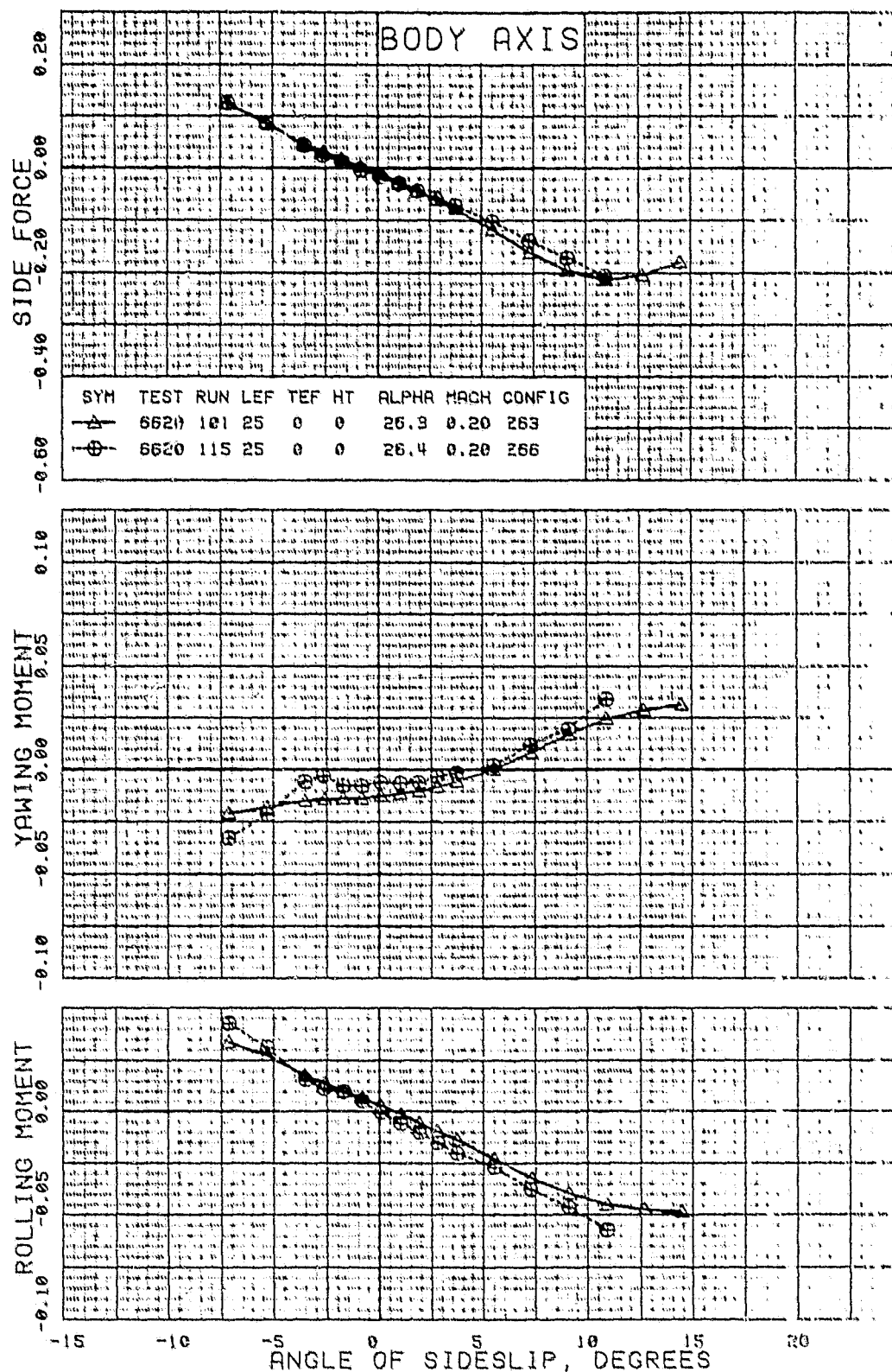


Figure 2-4 Effect of Strake Size (Z63 and Z66), YF-16 + 30.5 Stretch
(a) Force and Moments, $\alpha = 26^\circ$

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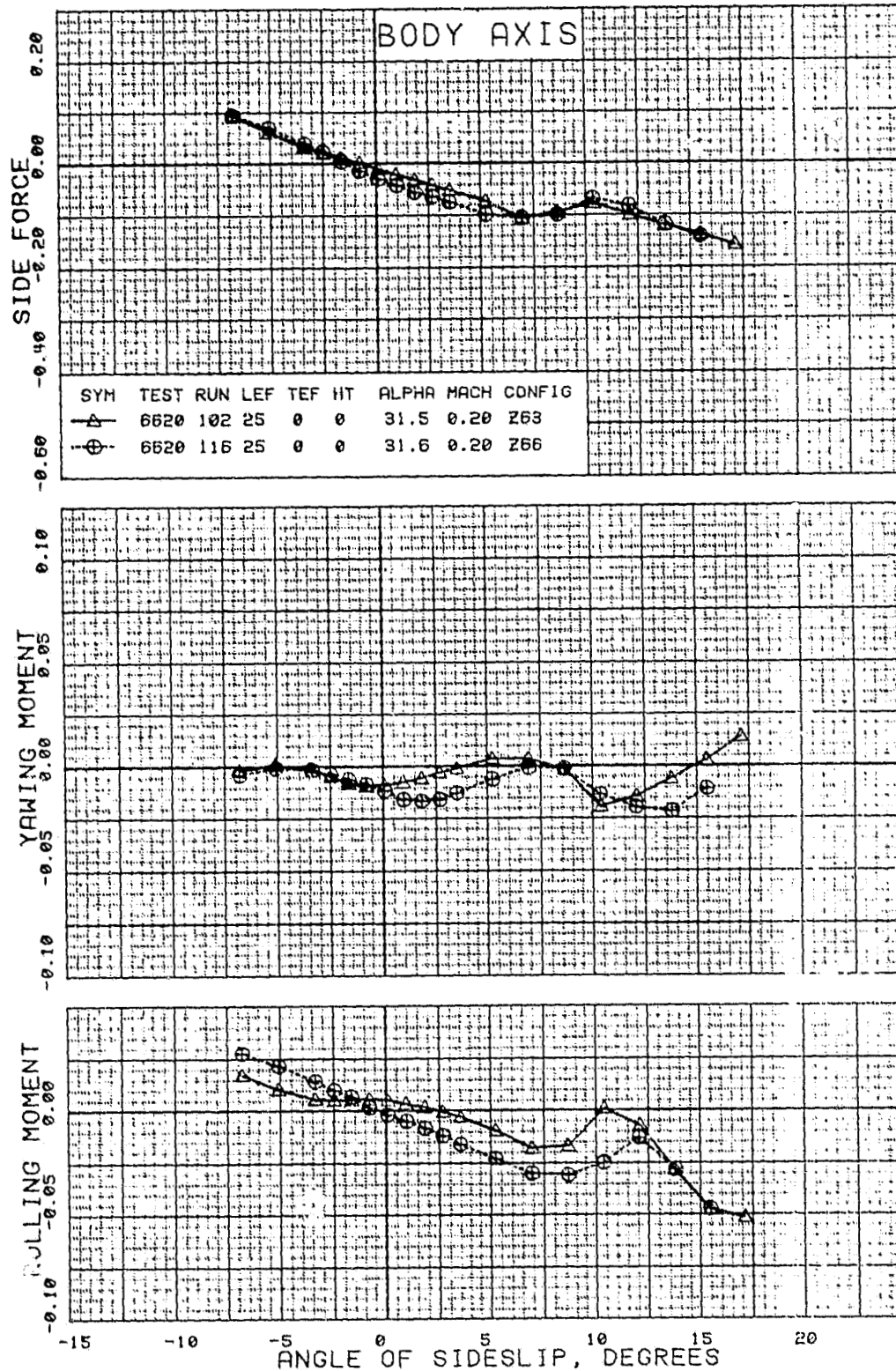


Figure 2-4 (b) Force and Moments, $\alpha = 32^\circ$

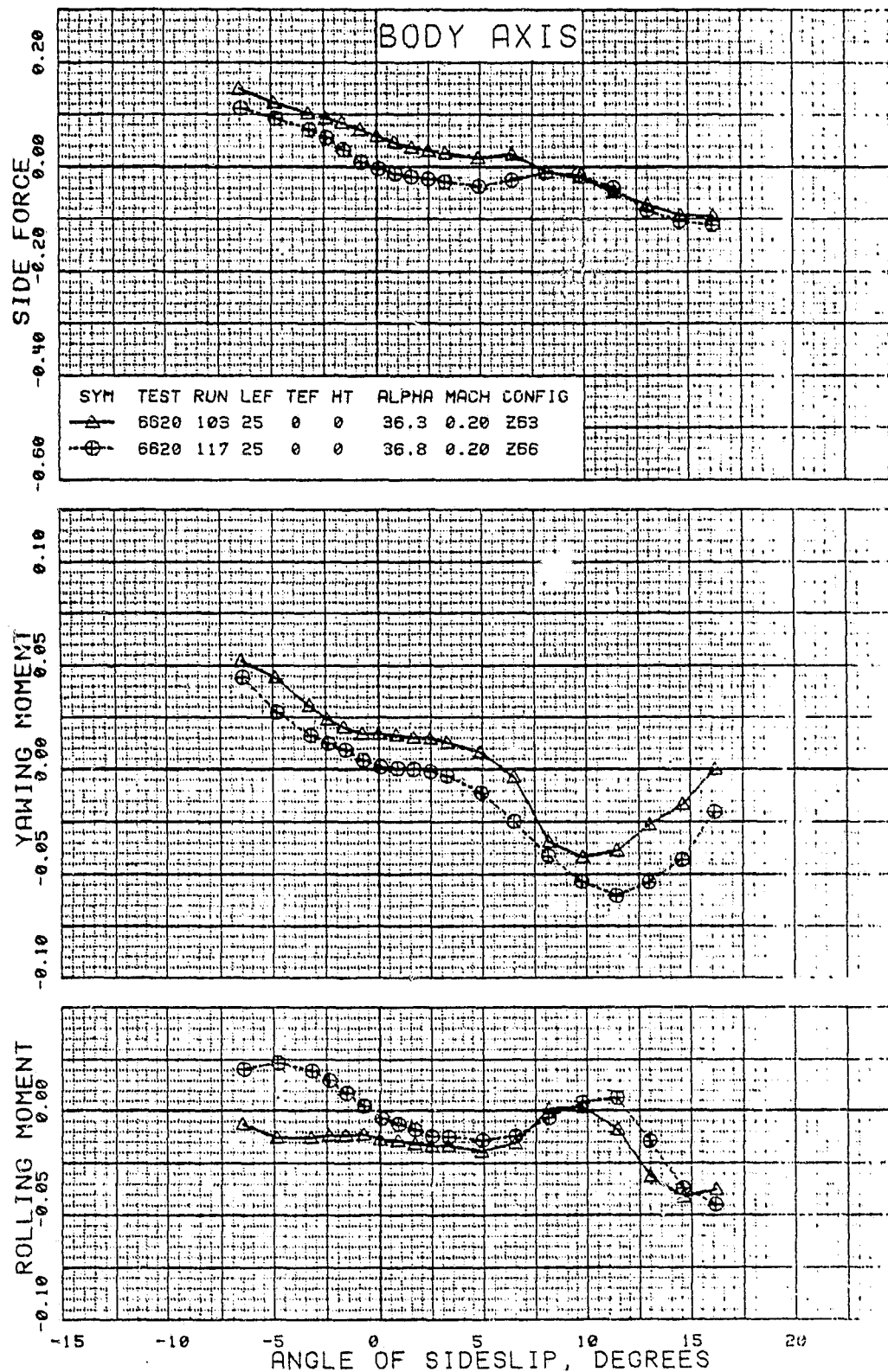


Figure 2-4 (c) Force and Moments, $\alpha = 36^\circ$

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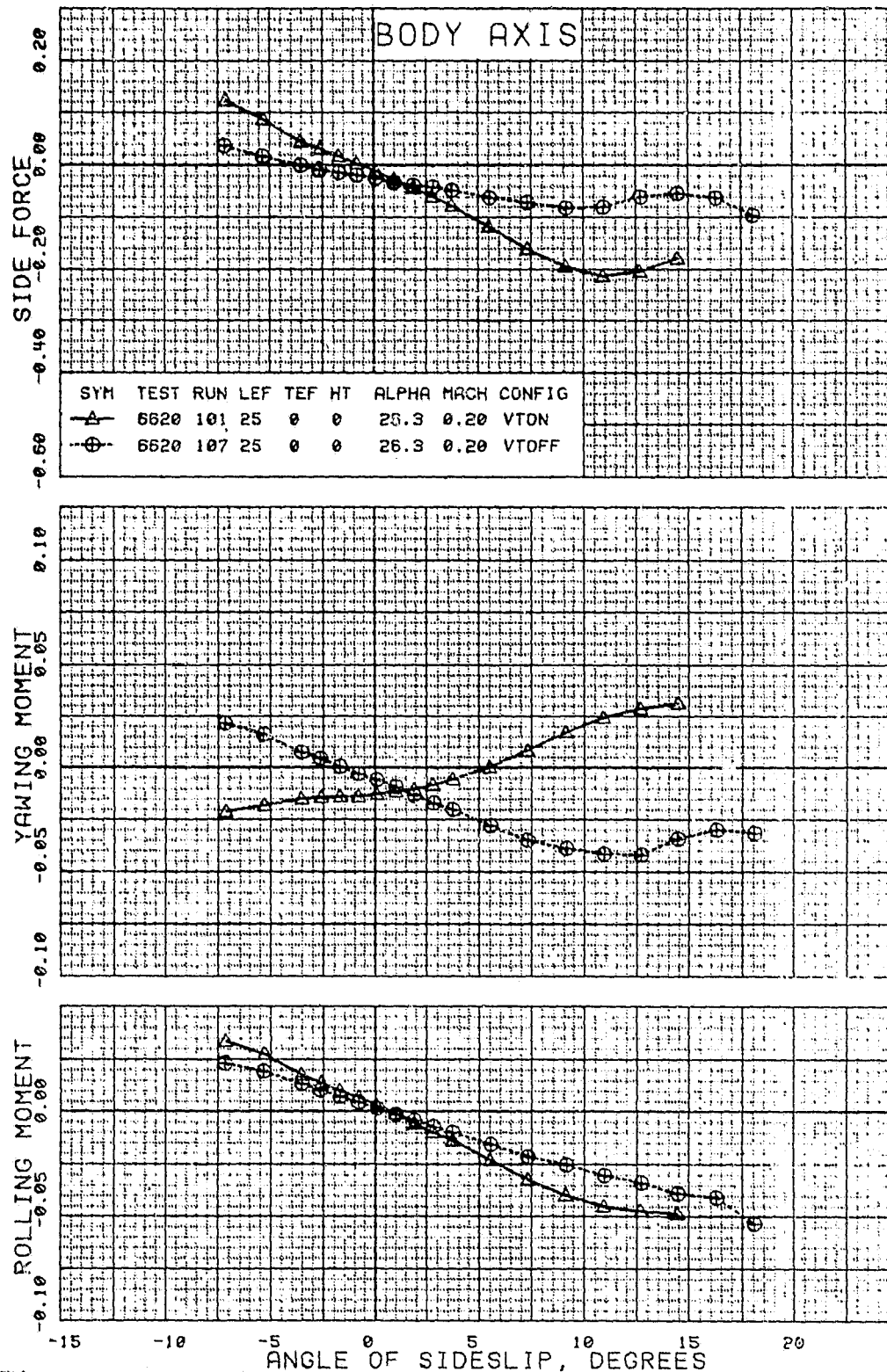


Figure 2-5 Effect of Vertical Tail with Forebody Strake
Z63, YF-16 + 30.5 Stretch
(a) Force and Moments, $\alpha = 26^\circ$

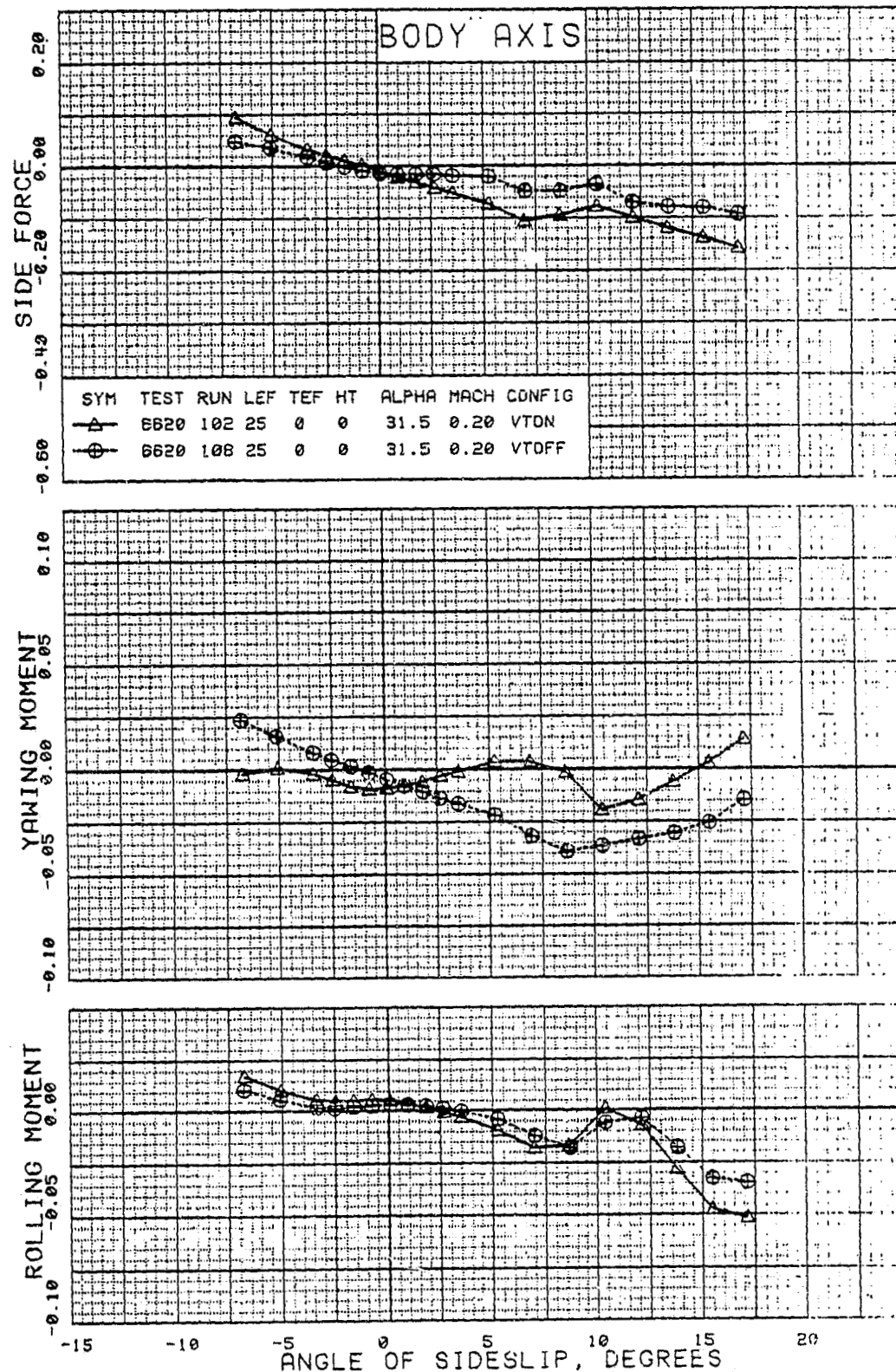


Figure 2-5 (b) Force and Moments, $\alpha = 32^\circ$

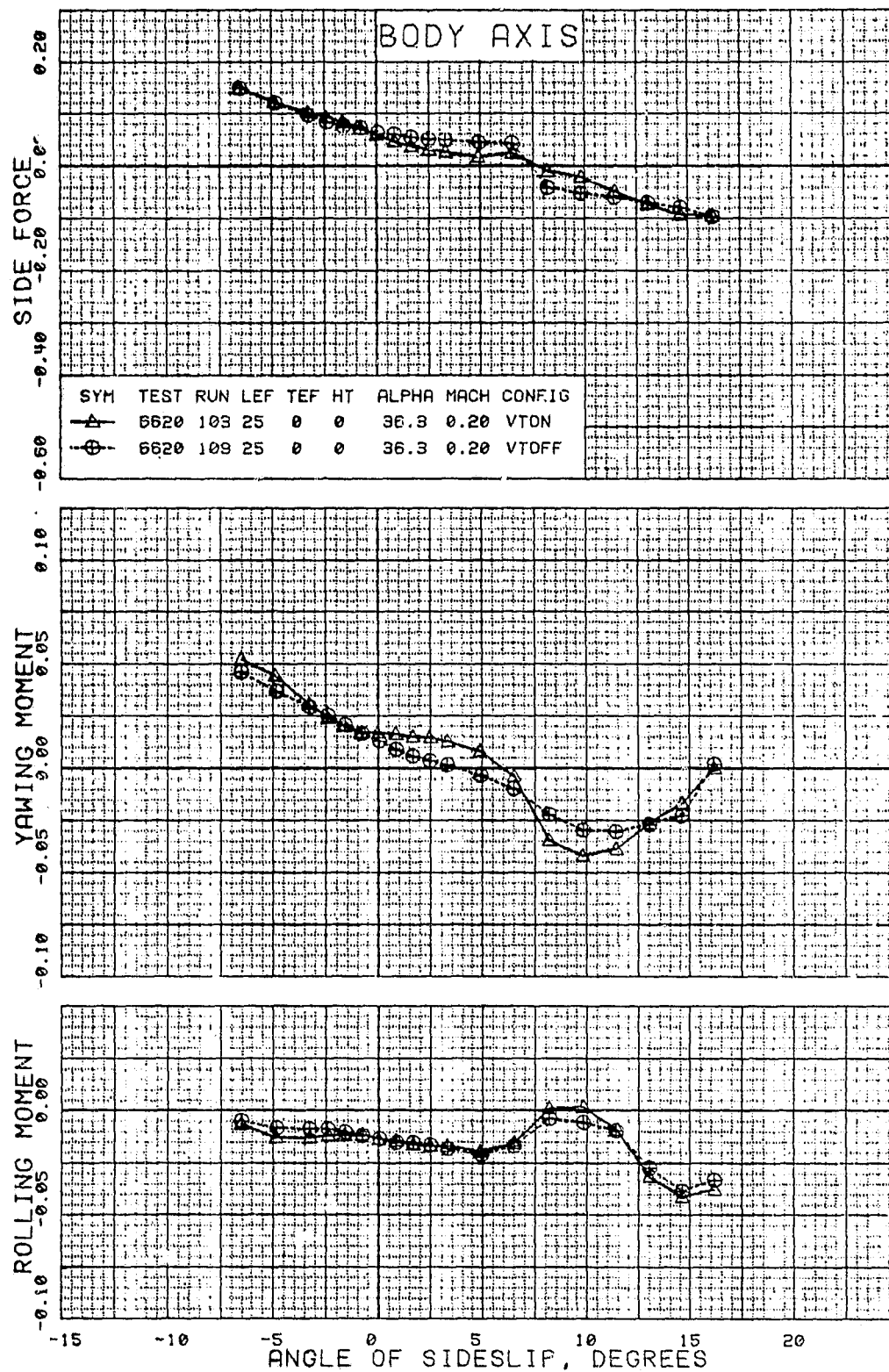


Figure 2-5 (c) Force and Moments, $\alpha = 36^\circ$

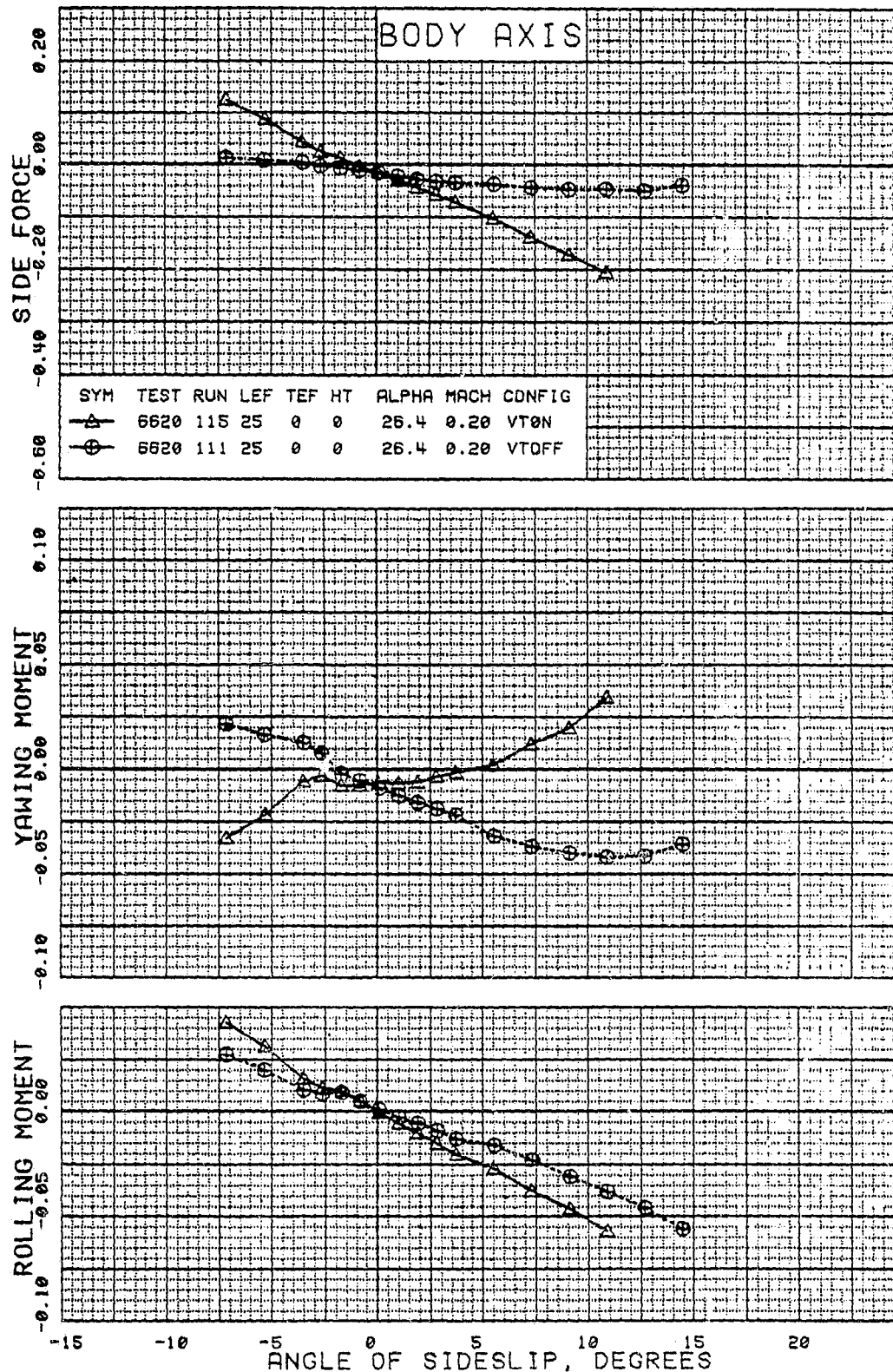


Figure 2-6 Effect of Vertical Tail with Forebody Strake
 266, YF-16 + 30.5 Stretch
 (a) Force and Moments, $\alpha = 26^\circ$

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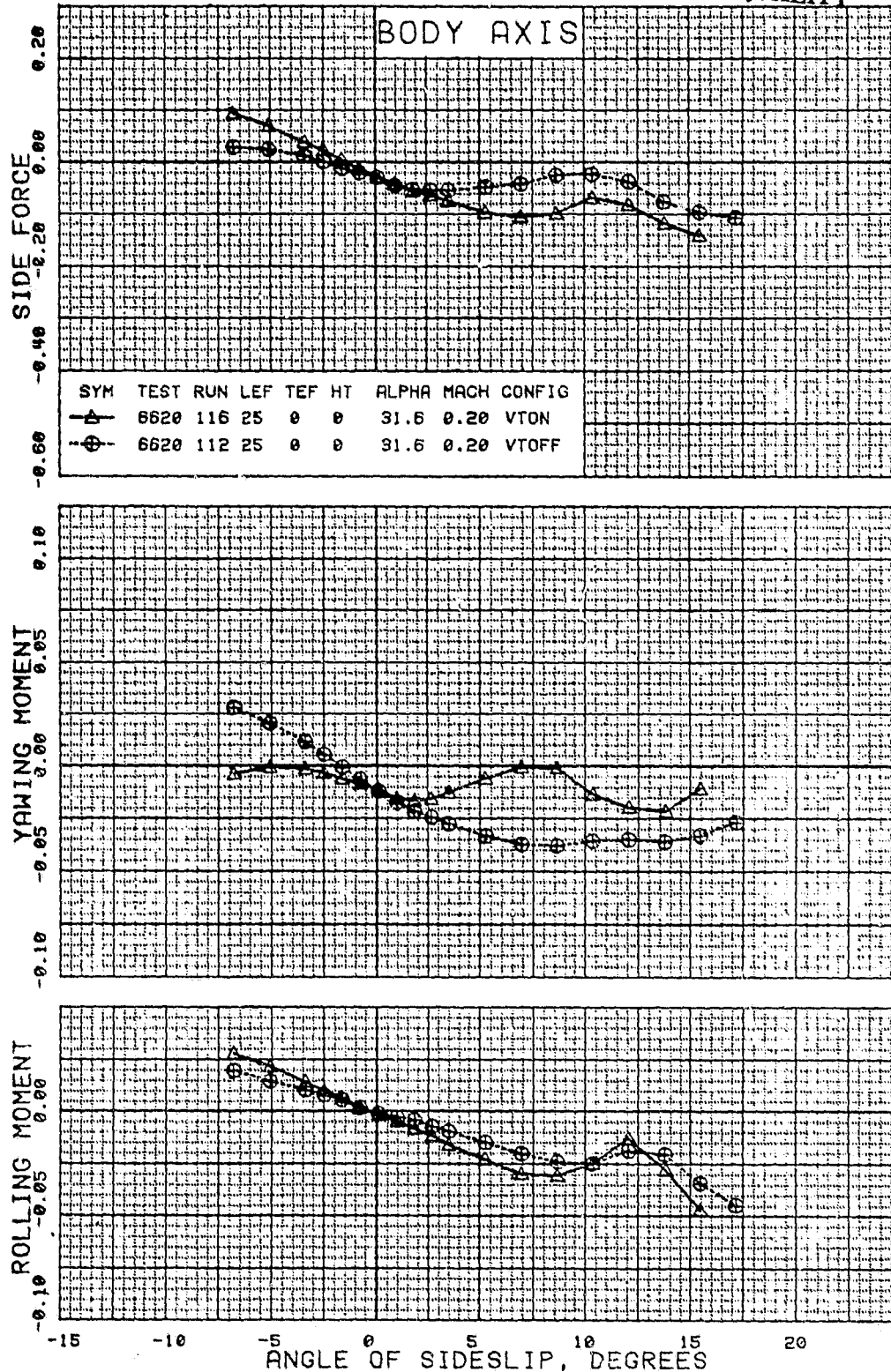


Figure 2-6 (b) Force and Moments, $\alpha=32^\circ$

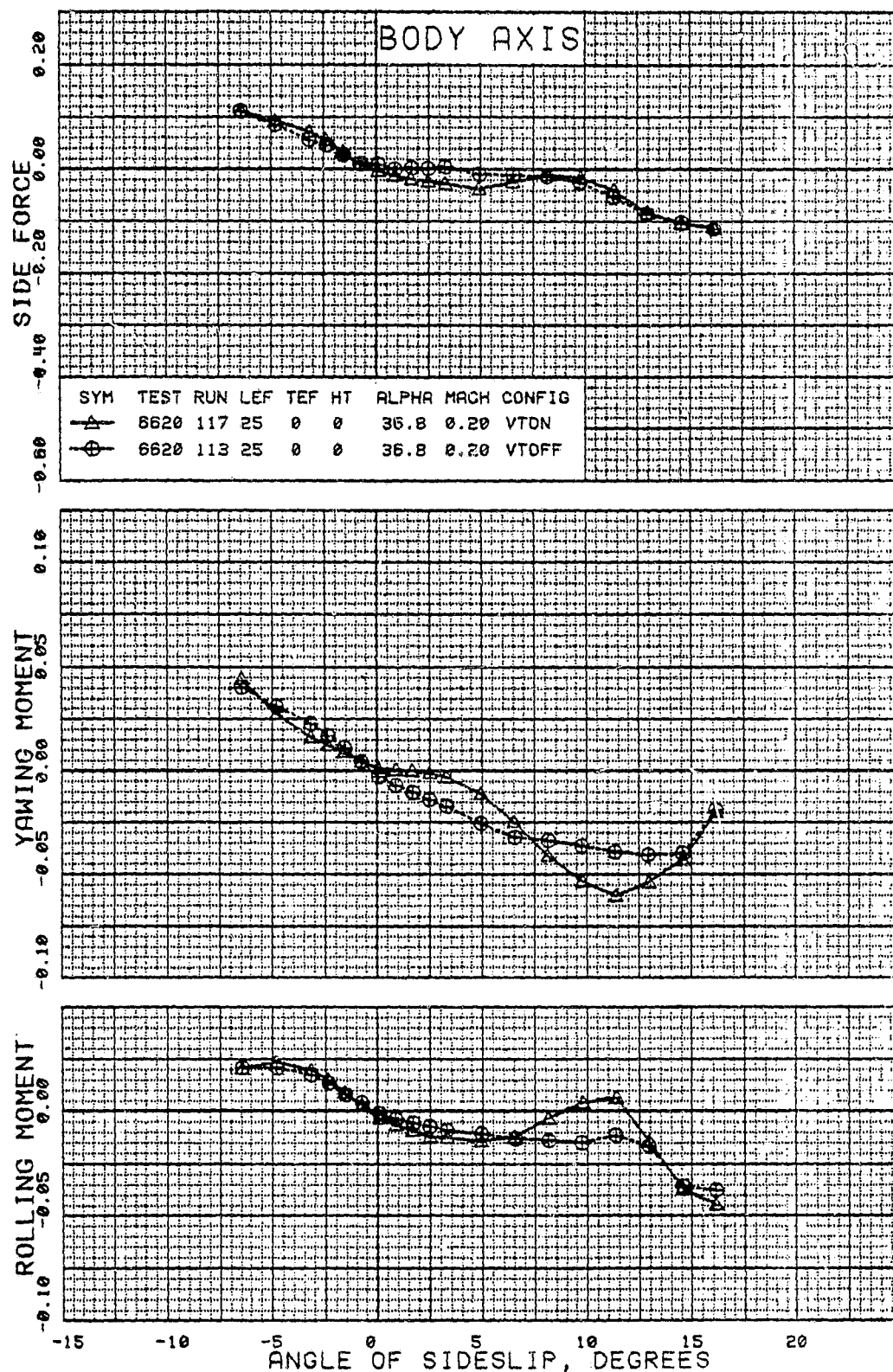


Figure 2-6 (c) Force and Moments, $\alpha = 37^\circ$

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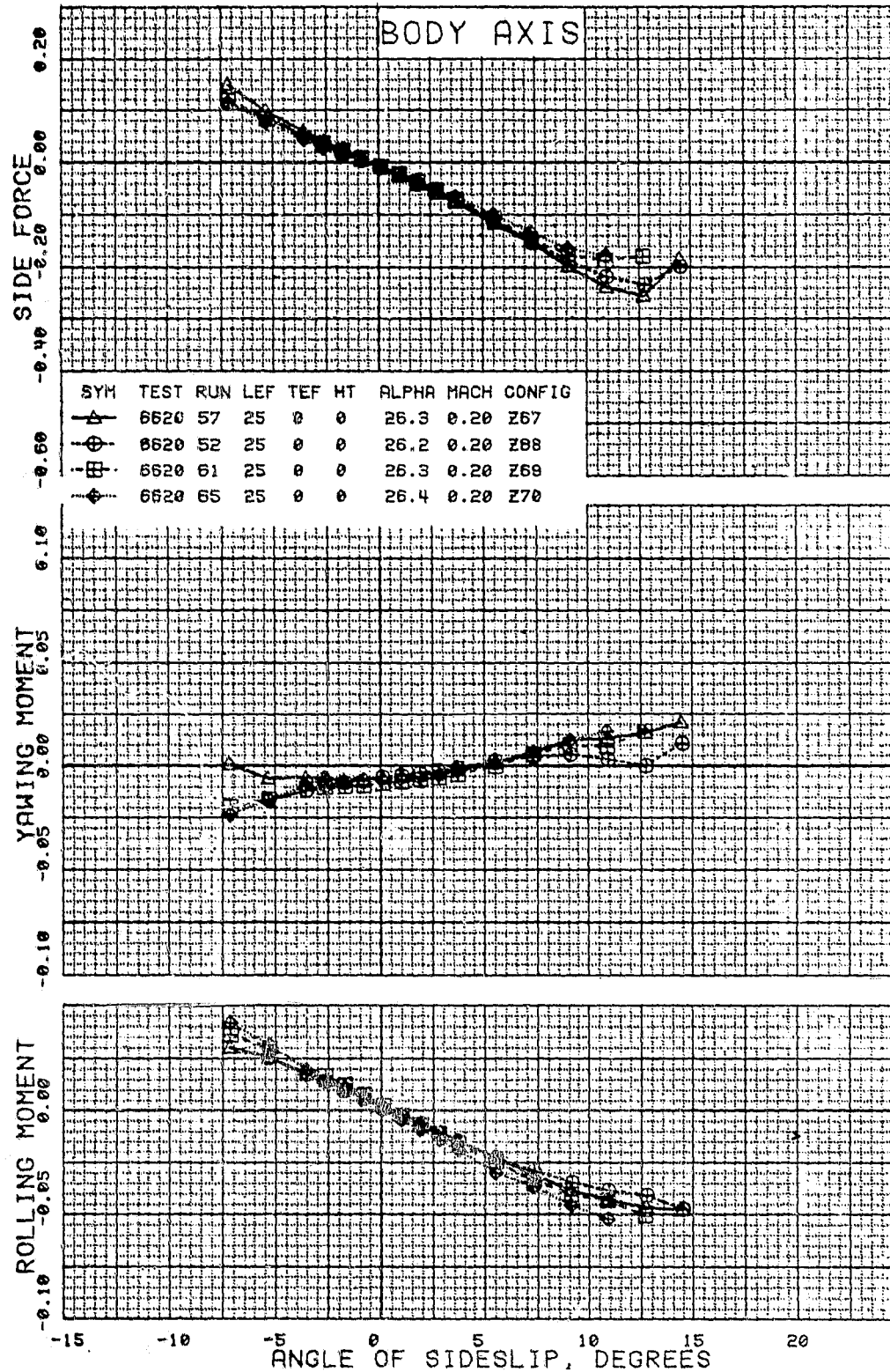


Figure 2-7 Effect of Forebody Strake
Z67-Z70, YF-16 + 30.5 Stretch
(a) Force and Moments, $\alpha = 26^\circ$

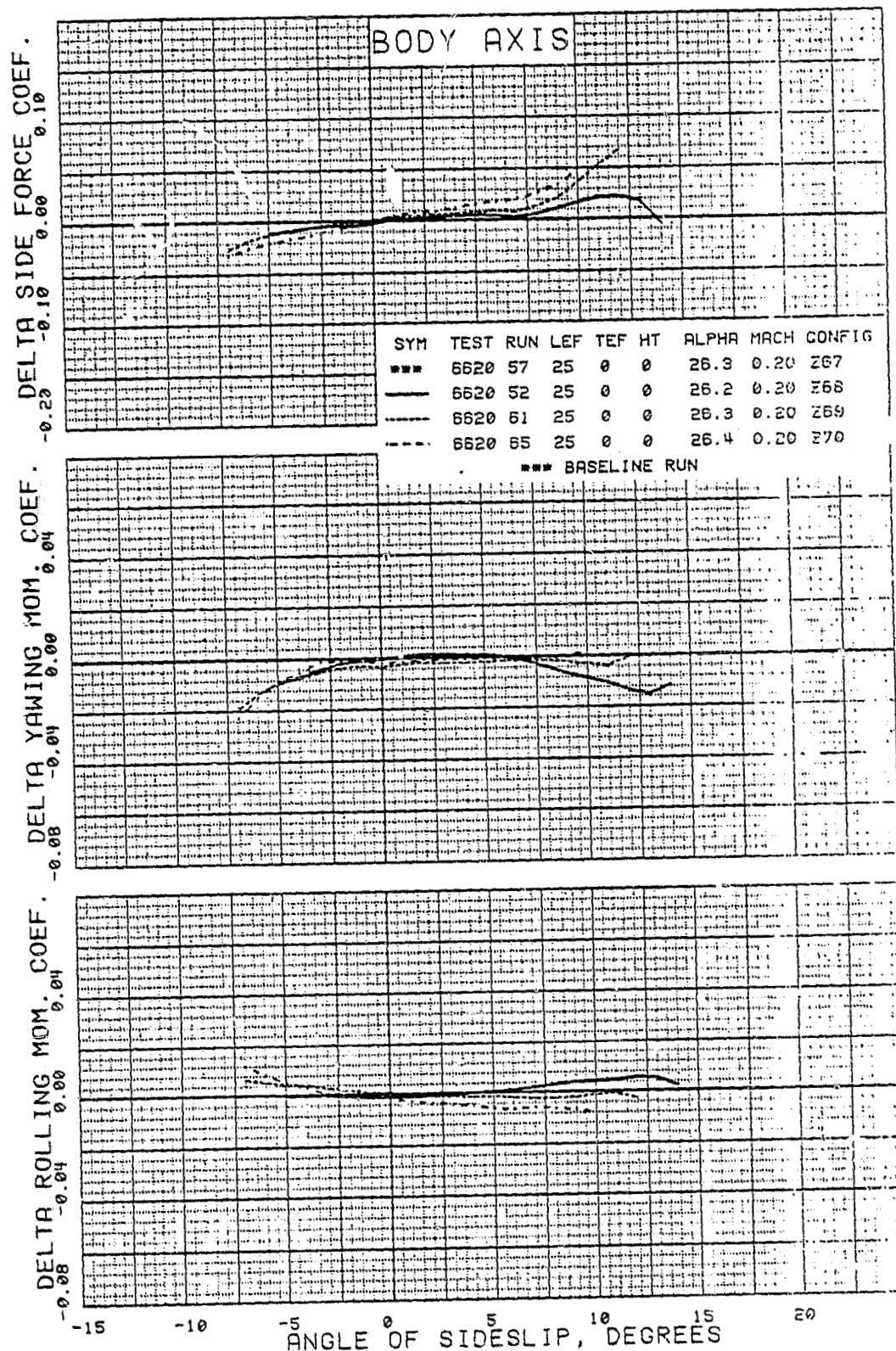
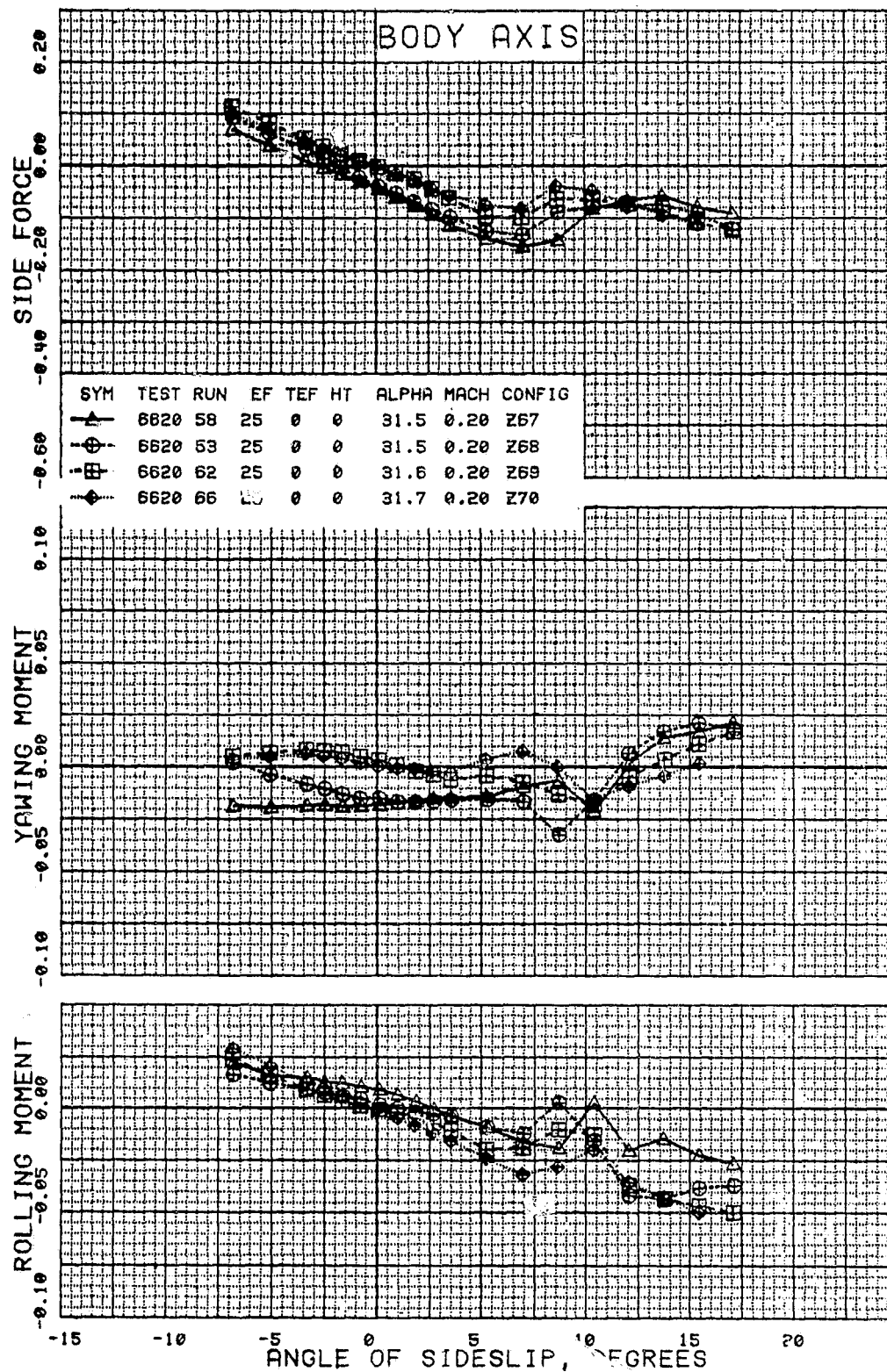


Figure 2-7 (b) Increments, $\alpha=26^\circ$



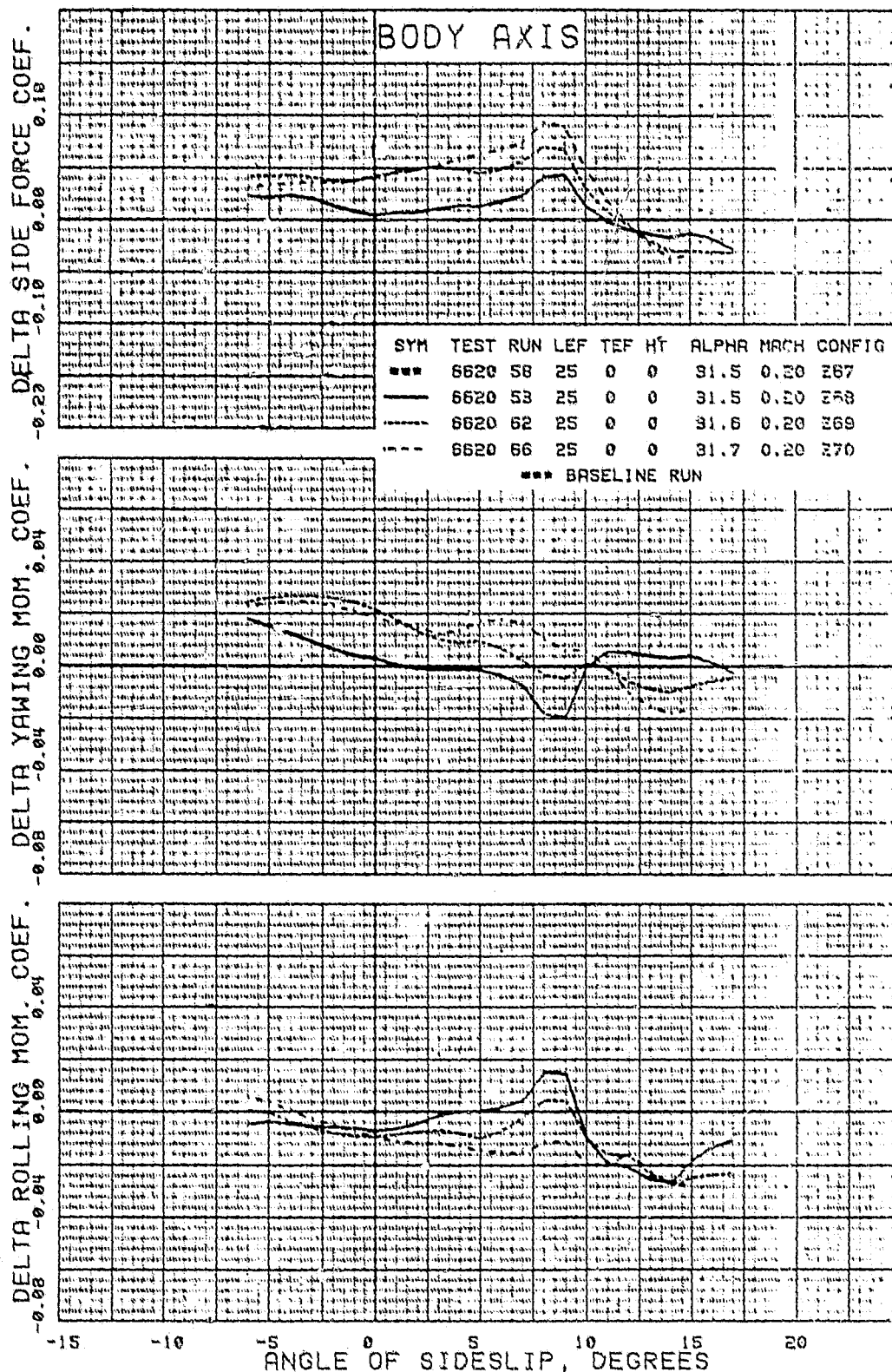


Figure 2-7 (d) Increments, $\alpha = 32^\circ$

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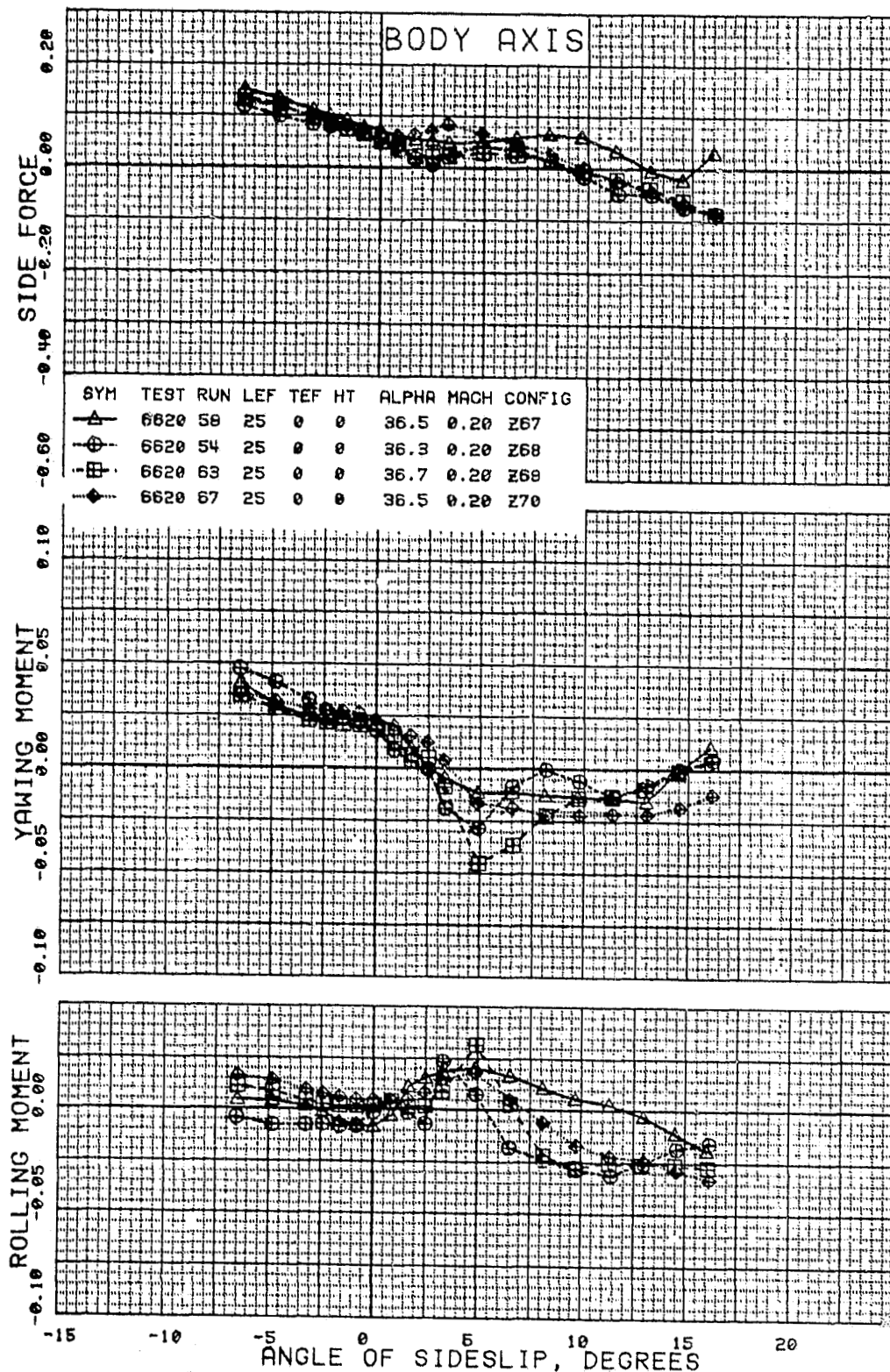


Figure 2-7 (e) Force and Moments, $\alpha = 37^\circ$

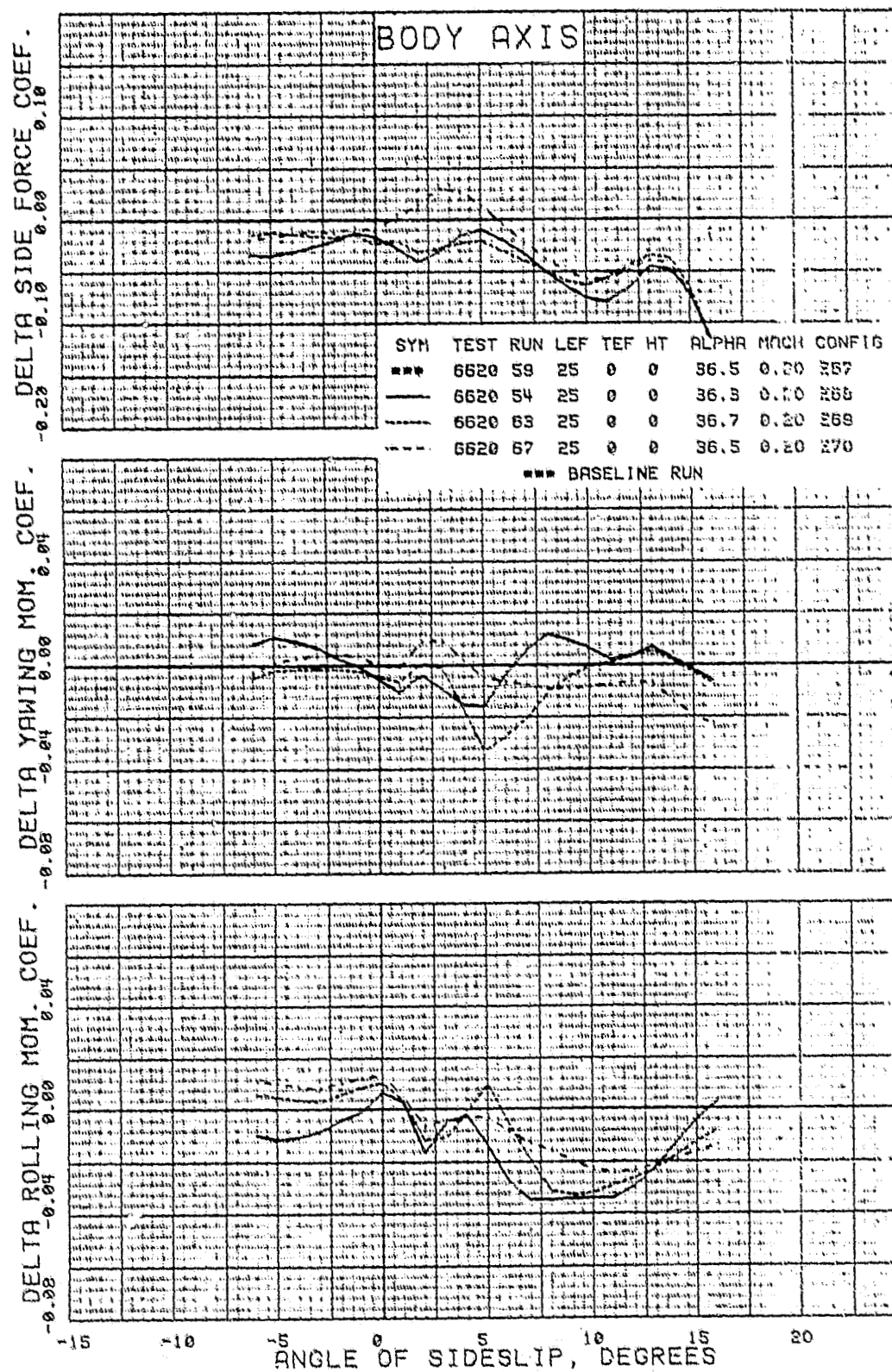


Figure 2-7 (f) Increments, $\alpha=370$

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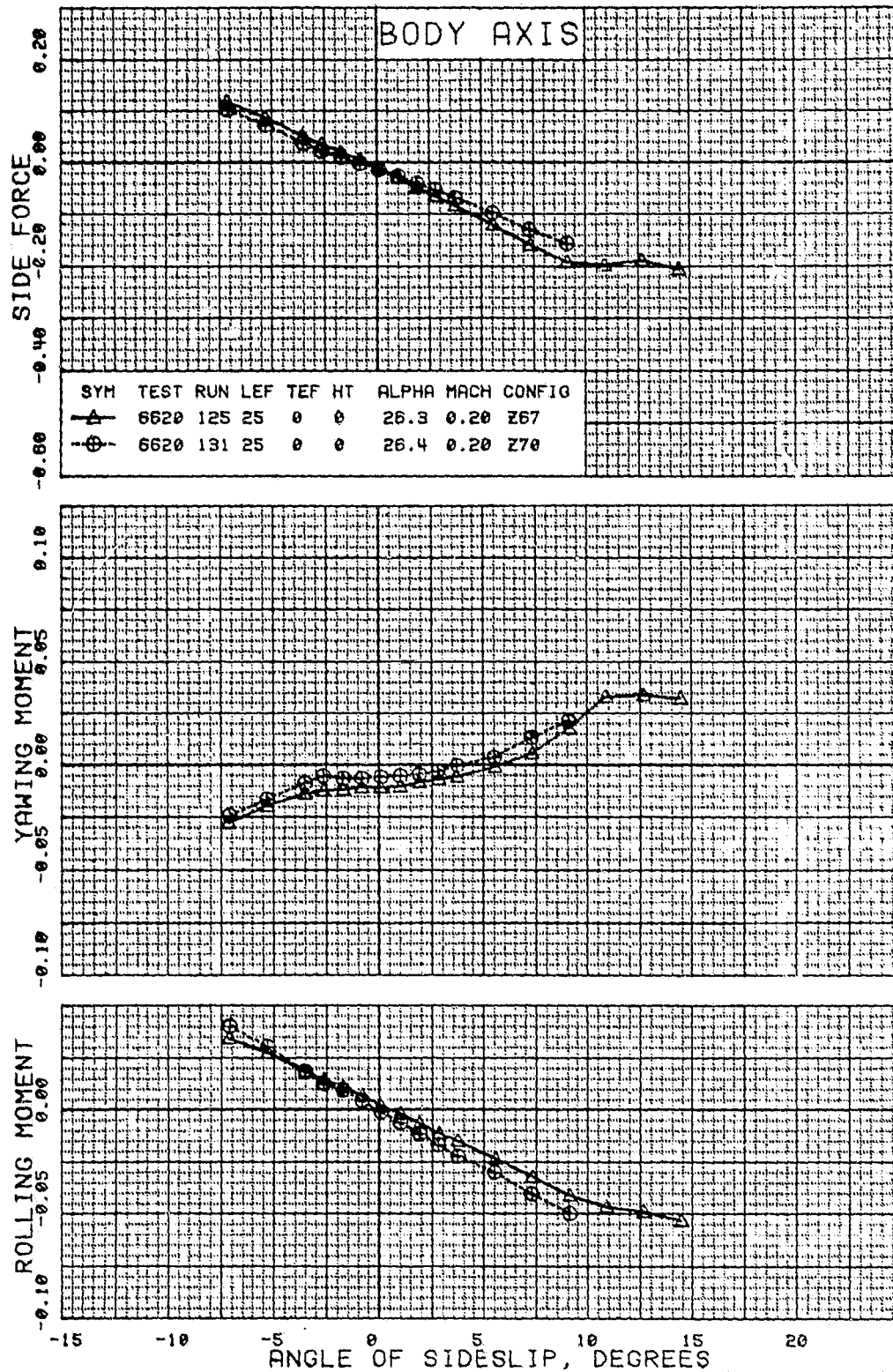


Figure 2-8 Effect of Forebody Strake Size (Z67 and Z70),
YF-16 + 30.5 Stretch
(a) Force and Moments, $\alpha=26^\circ$

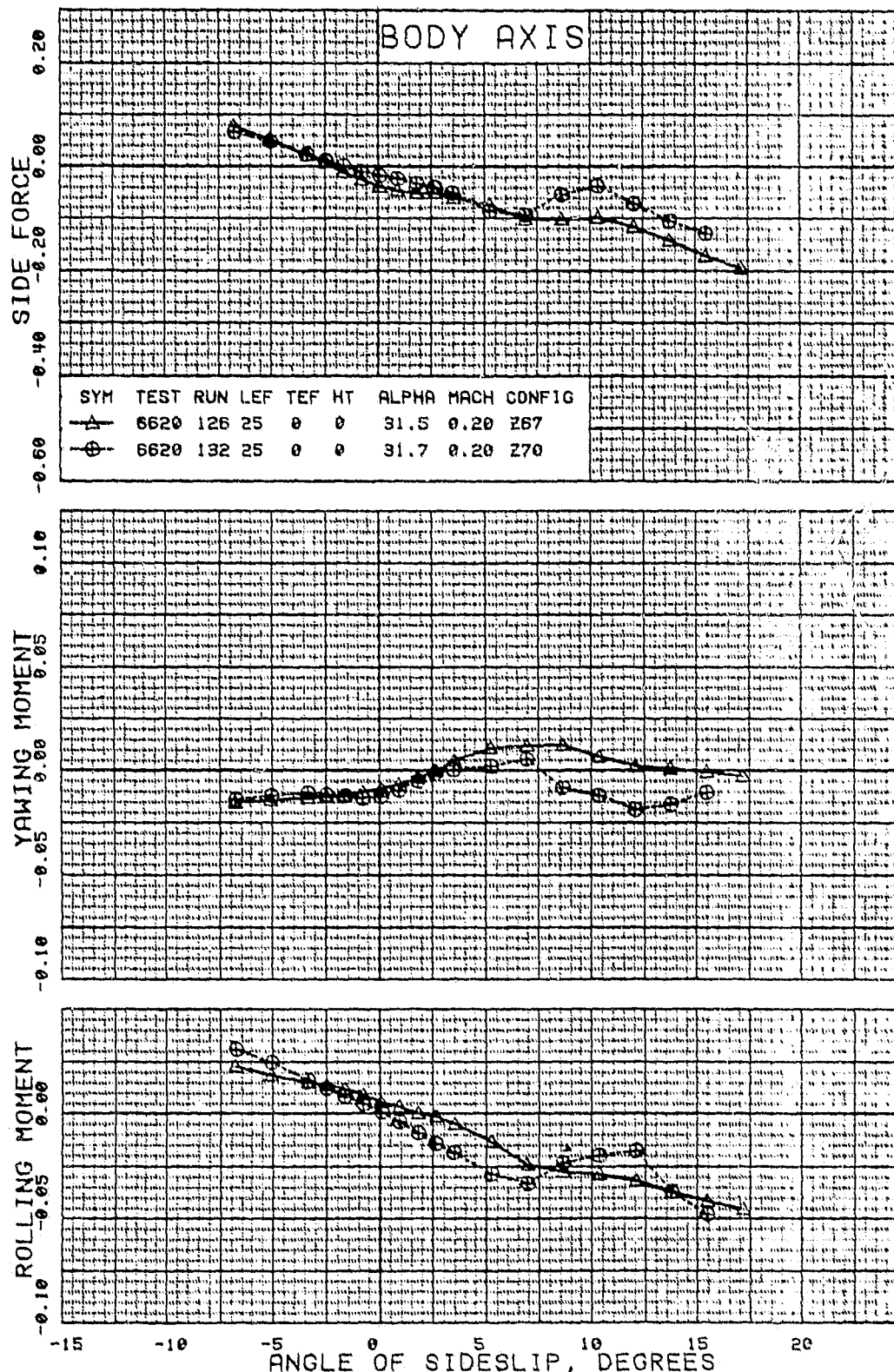


Figure 2-8 (b) Force and Moments, $\alpha=32^\circ$

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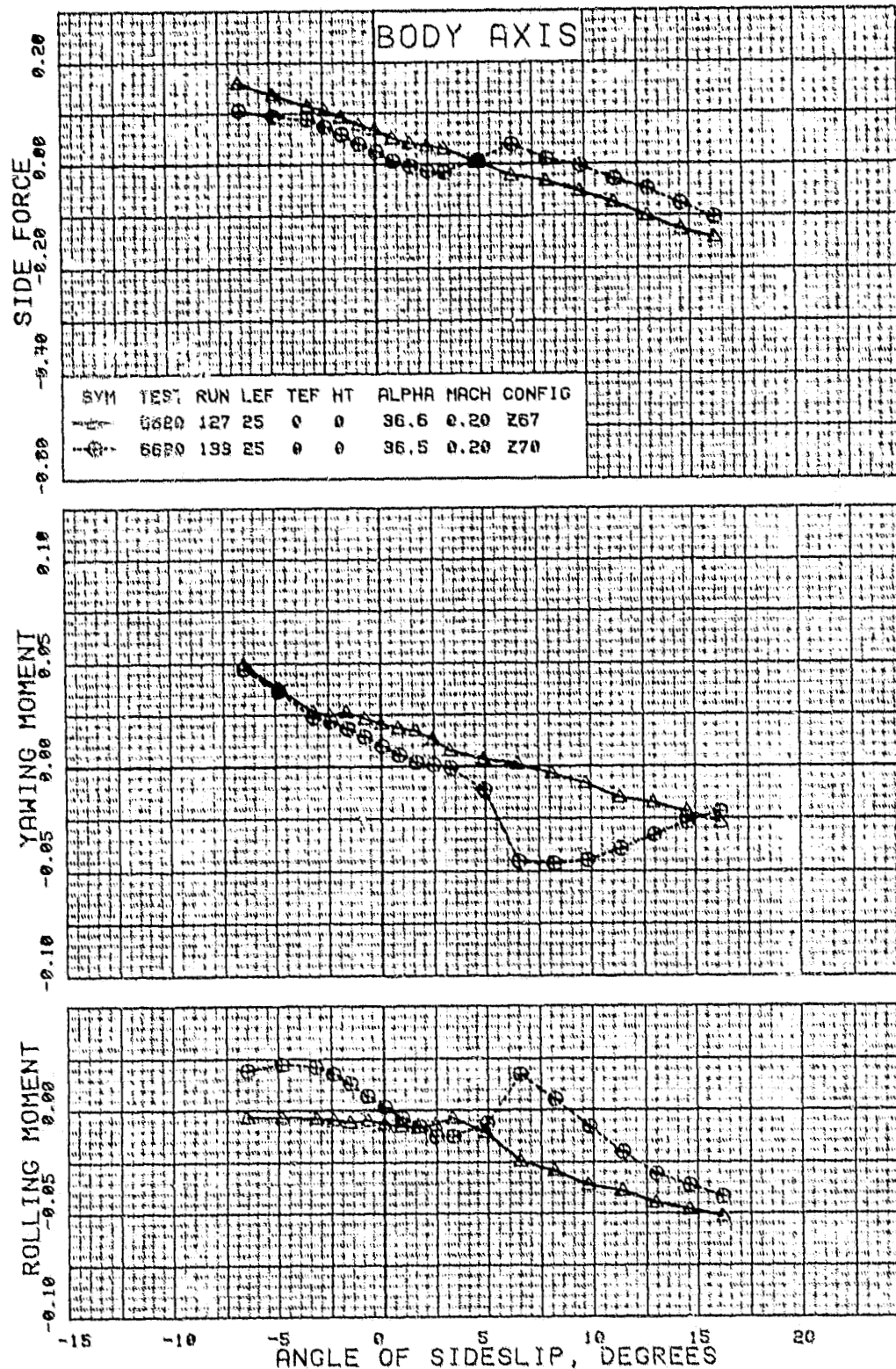


Figure 2-8 (c) Force and Moments, $\alpha=37^\circ$

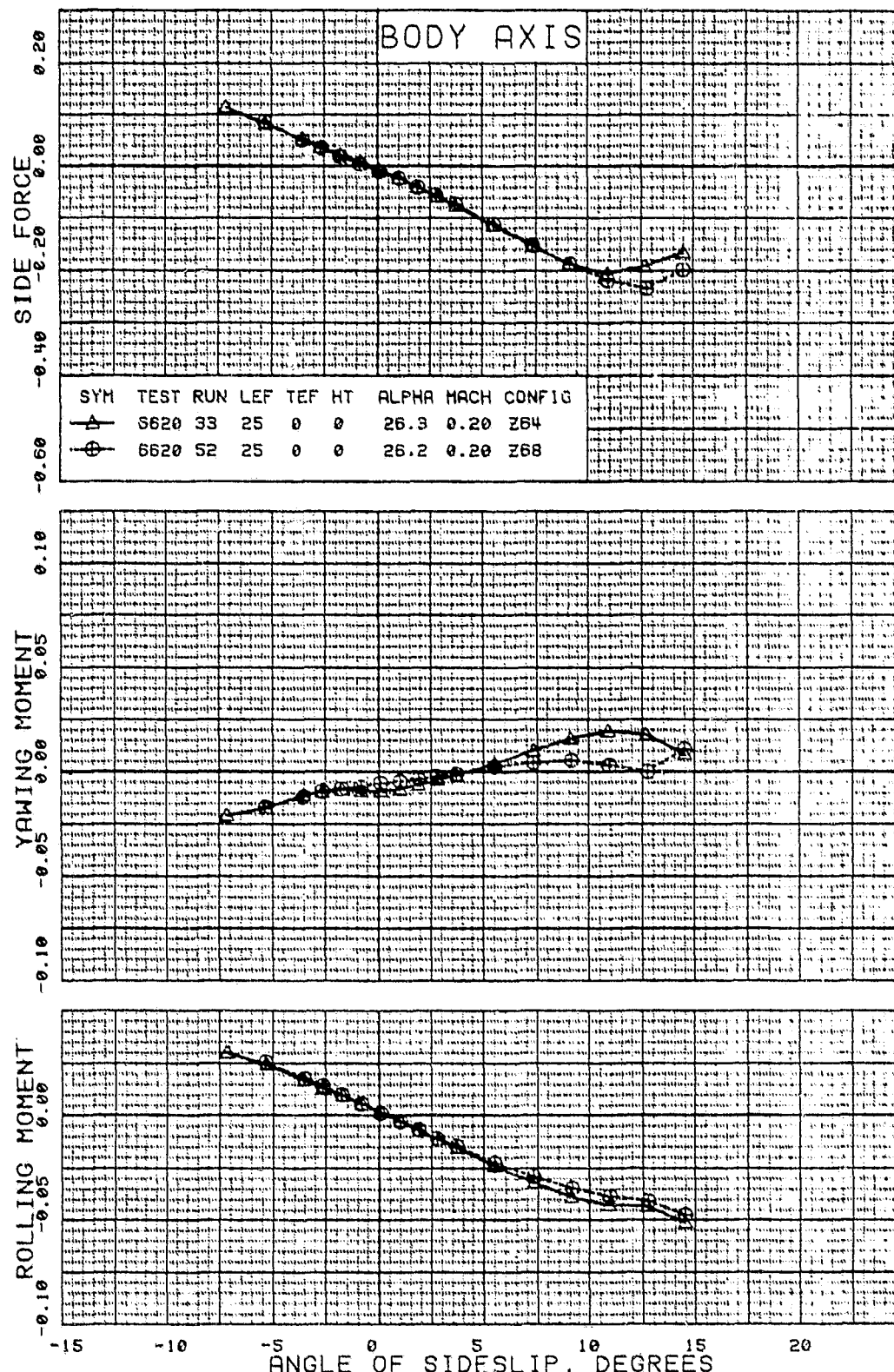


Figure 2-9 Effect of Fuselage Stretch, Z64 (30.5 Stretch) and Z68 (44.5 Stretch)
(a) Force and Moments, $\alpha = 26^\circ$

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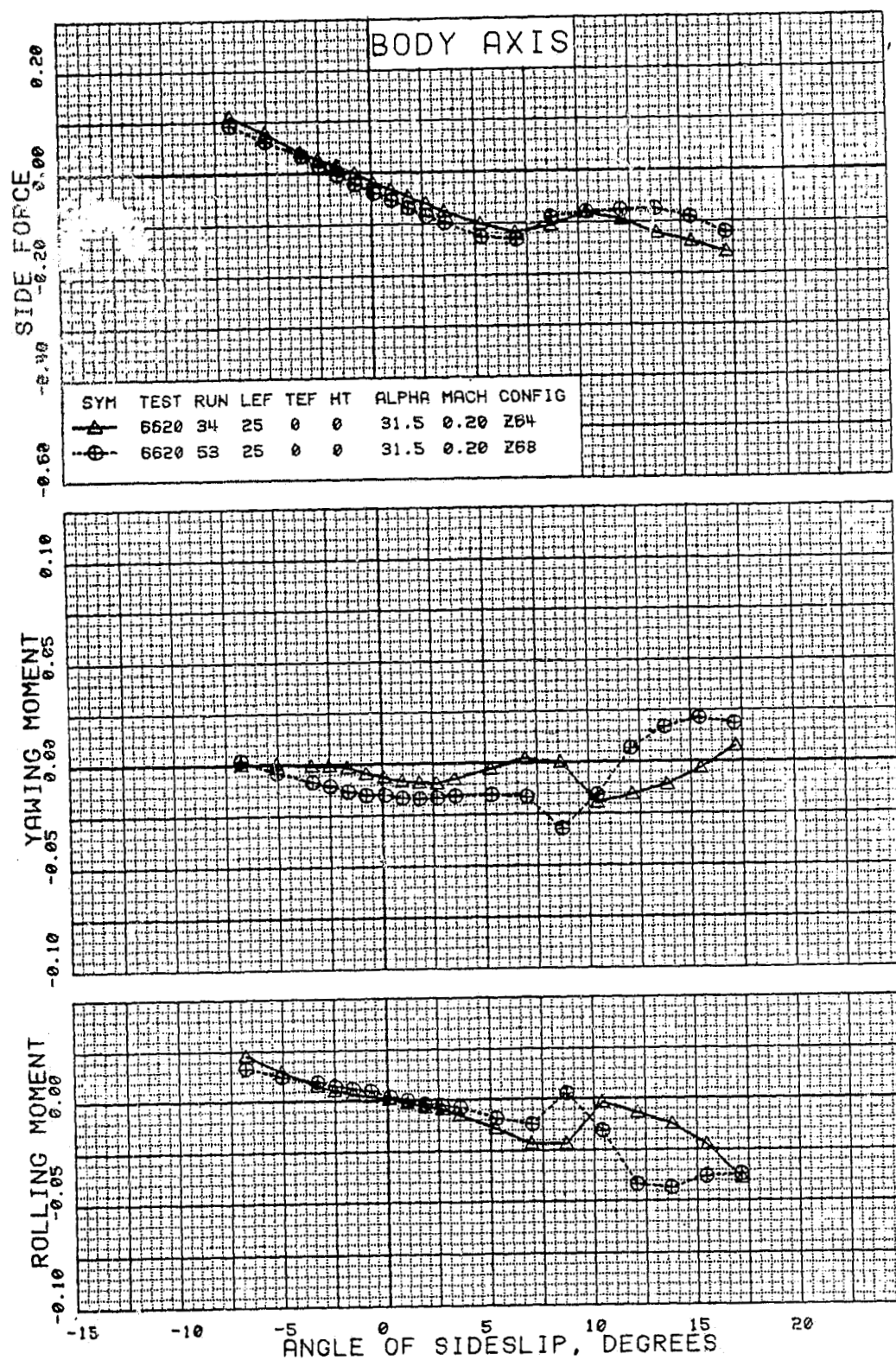


Figure 2-9 (b) Force and Moments. $\alpha=32^\circ$

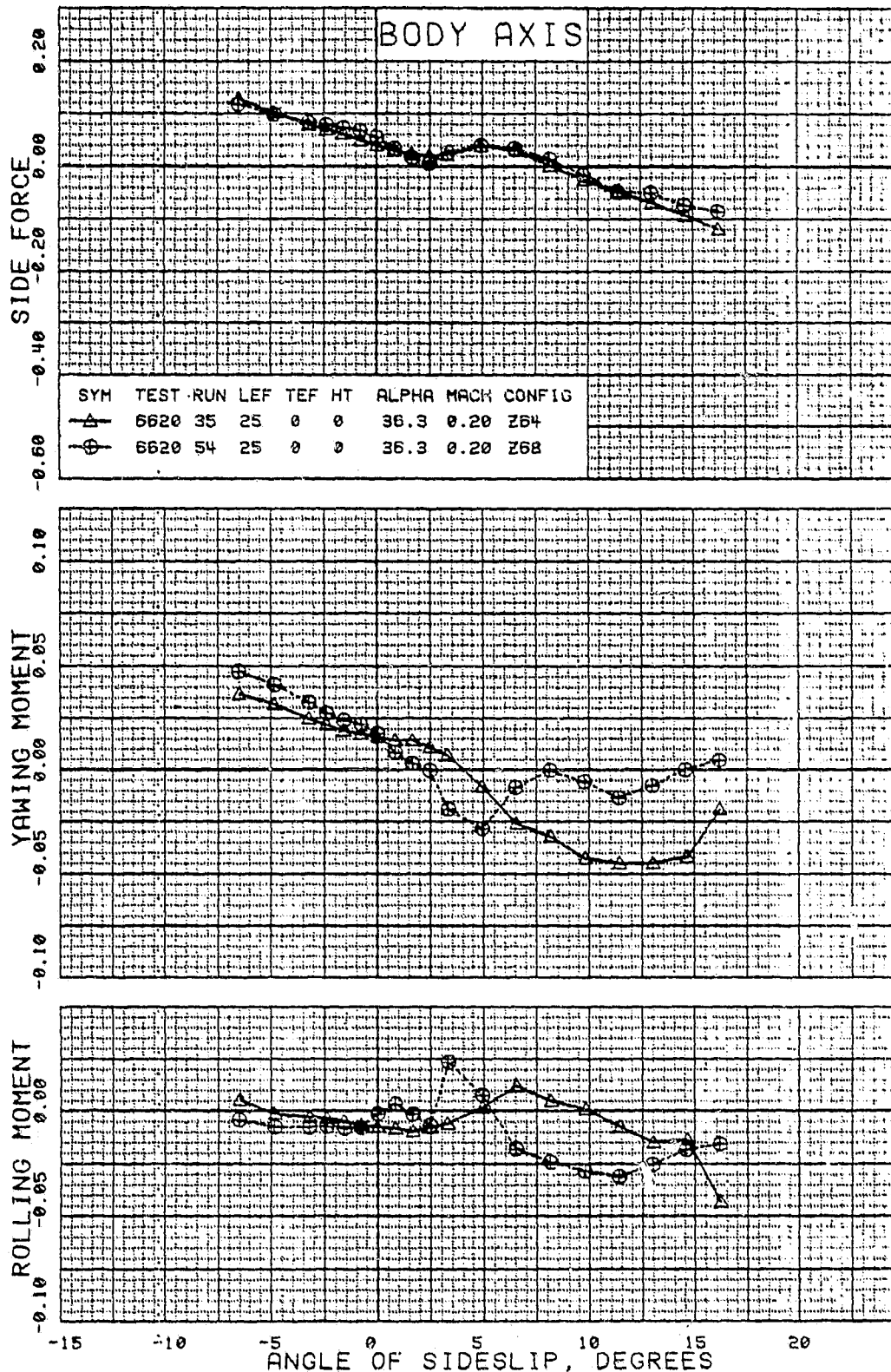


Figure 2-9 (c) Force and Moments, $\alpha = 36^\circ$

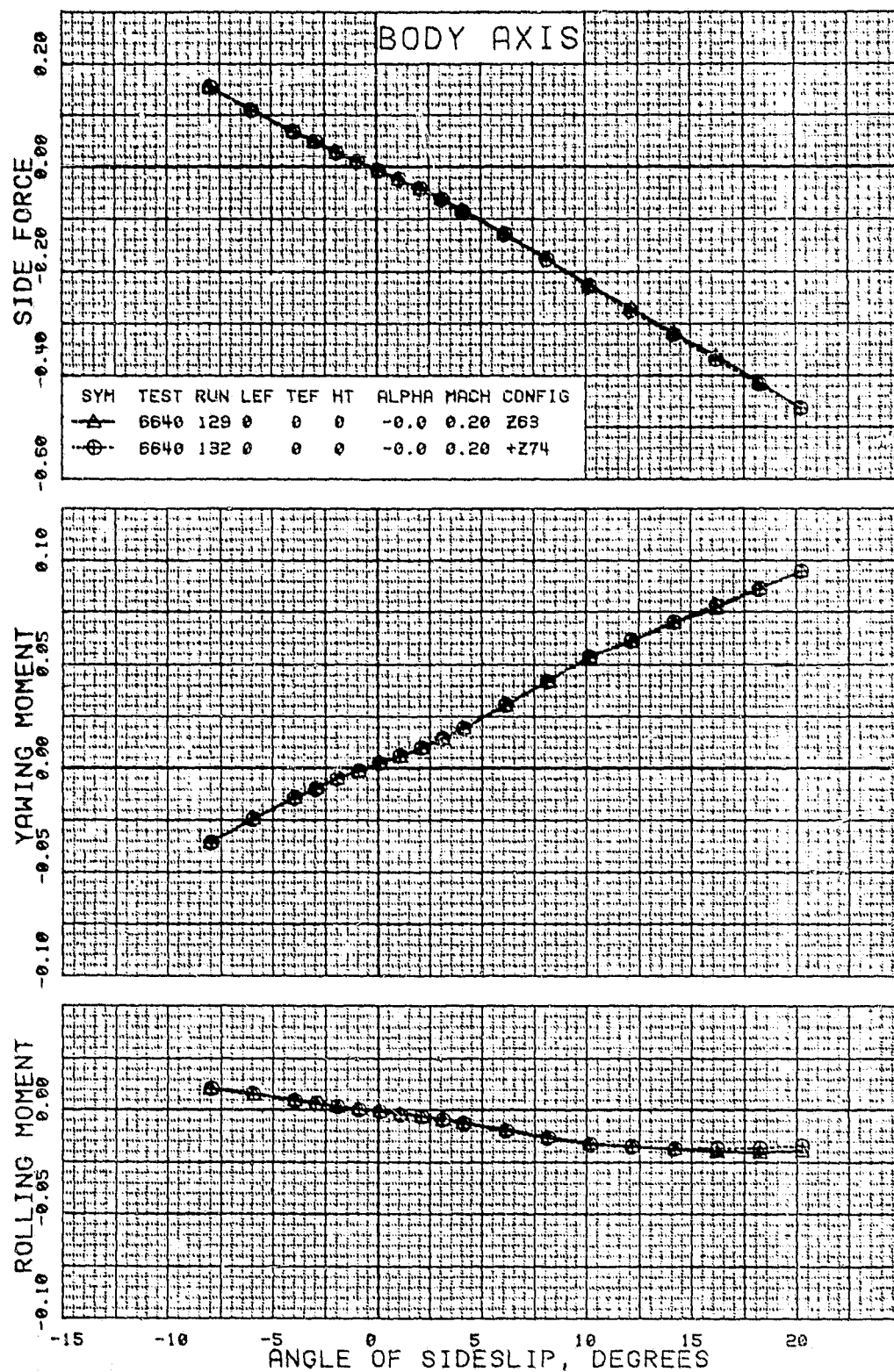


Figure 2-10 Effect of Nose Strake Z74, YF-16 + 30.5 Stretch
(a) Force and Moments, $\alpha = 0$

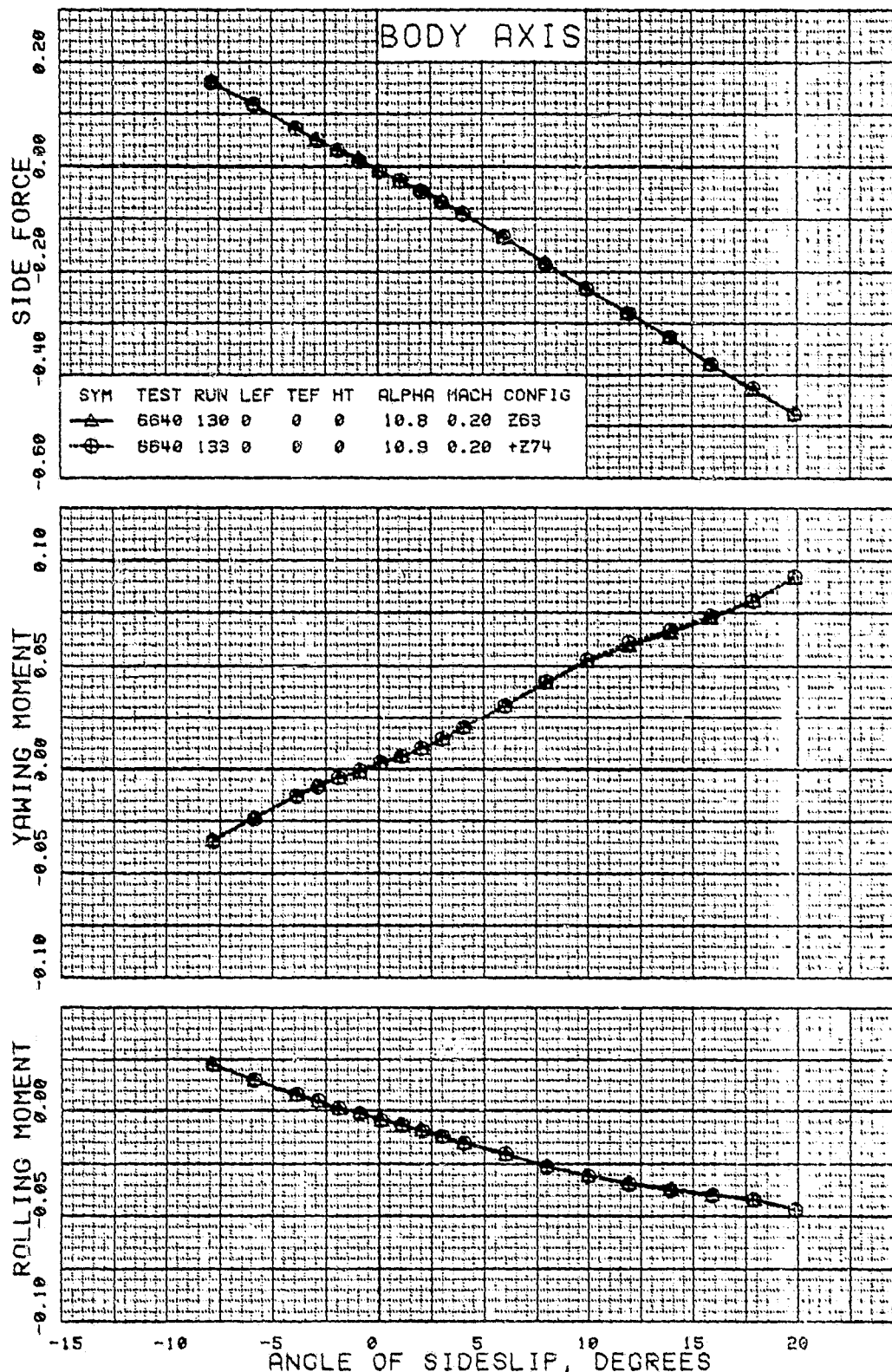


Figure 2-10 (b) Force and Moments, $\alpha = 11^\circ$

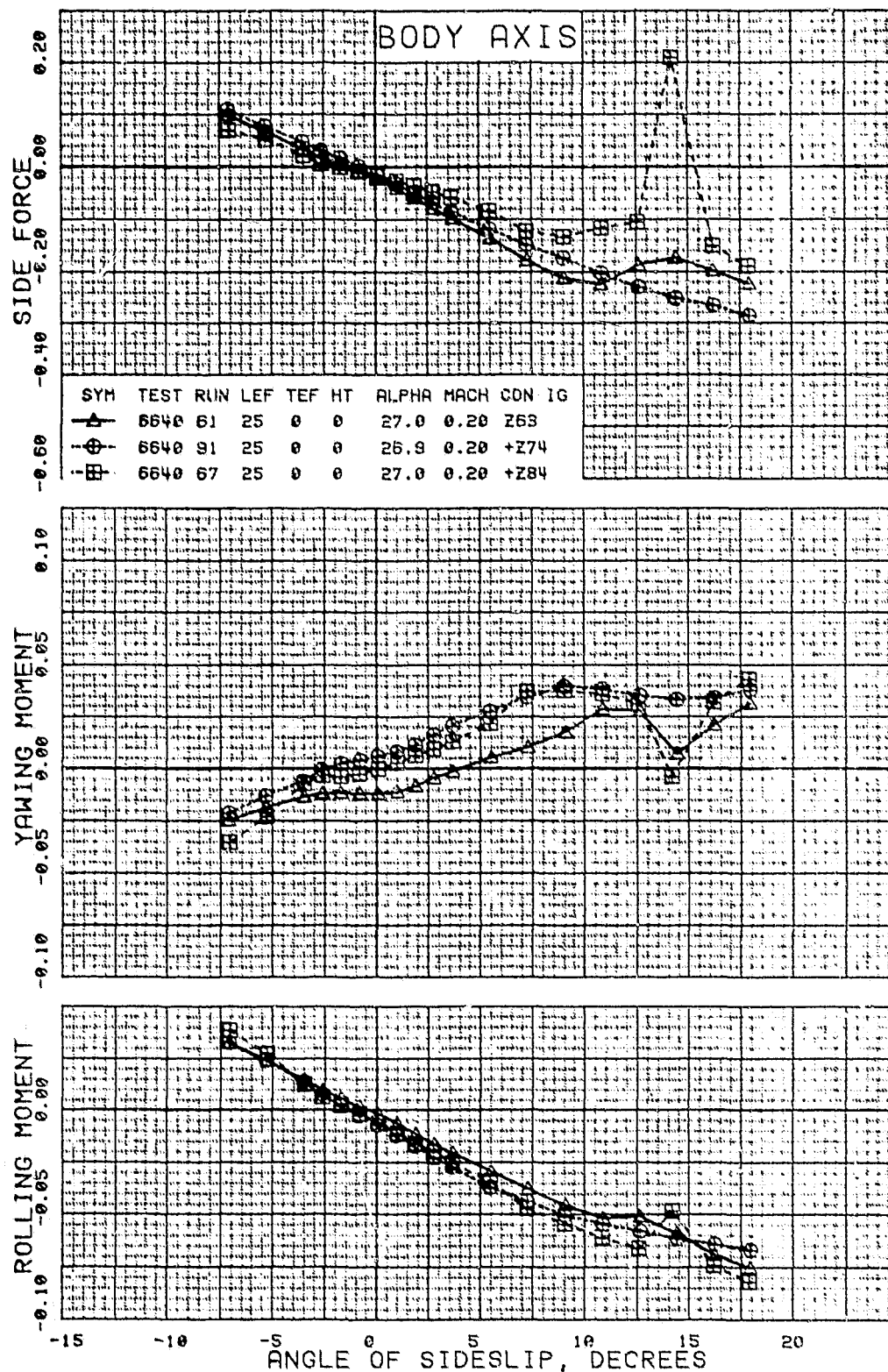


Figure 2-11 Effect of Nose, Z74, and Canard, Z84, Strakes, YF-16 + 30.5 Stretch
(a) Force and Moments, $\alpha = 27^\circ$

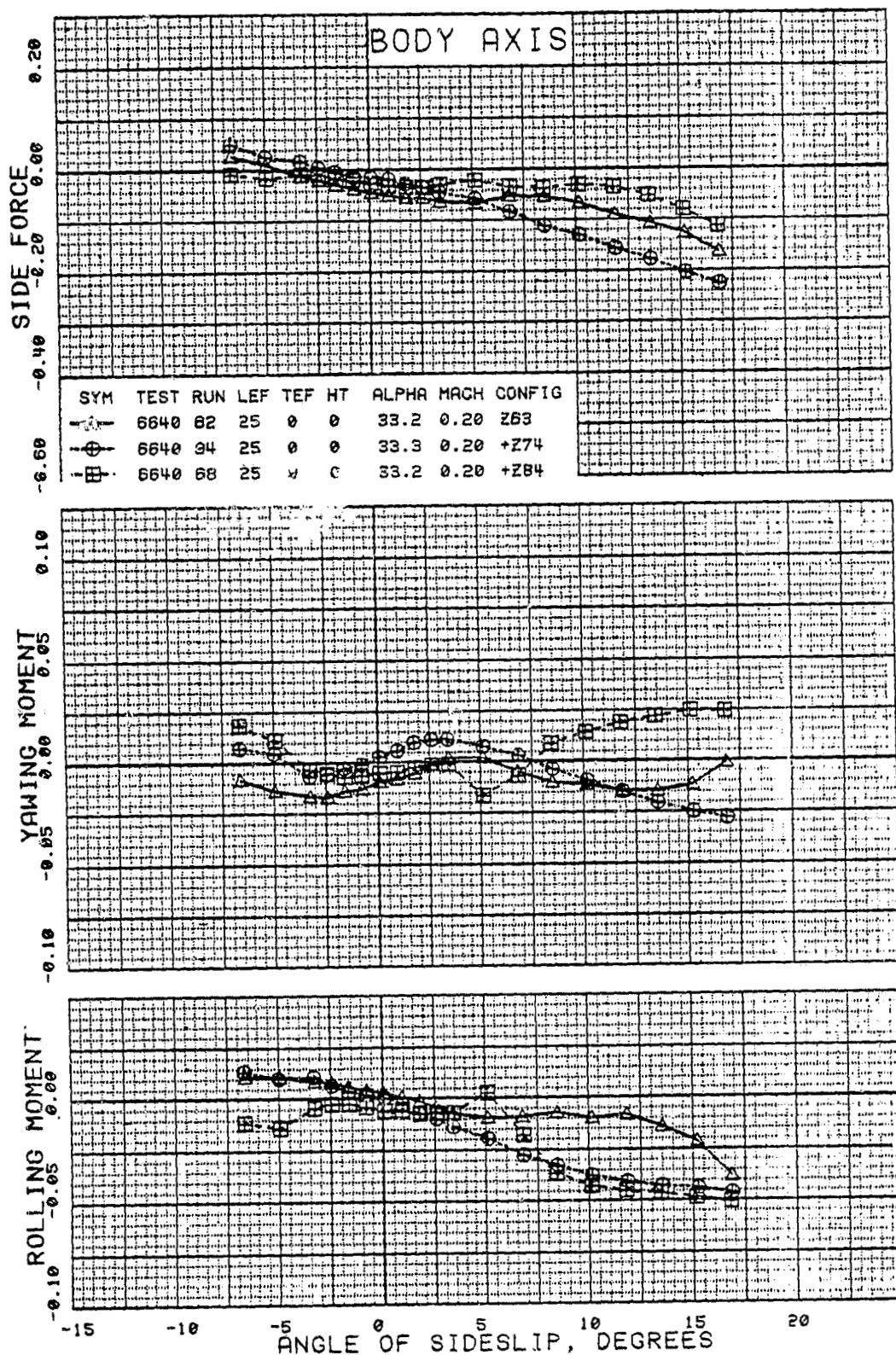


Figure 2-11 (b) Force and Moments, $\alpha=33^\circ$

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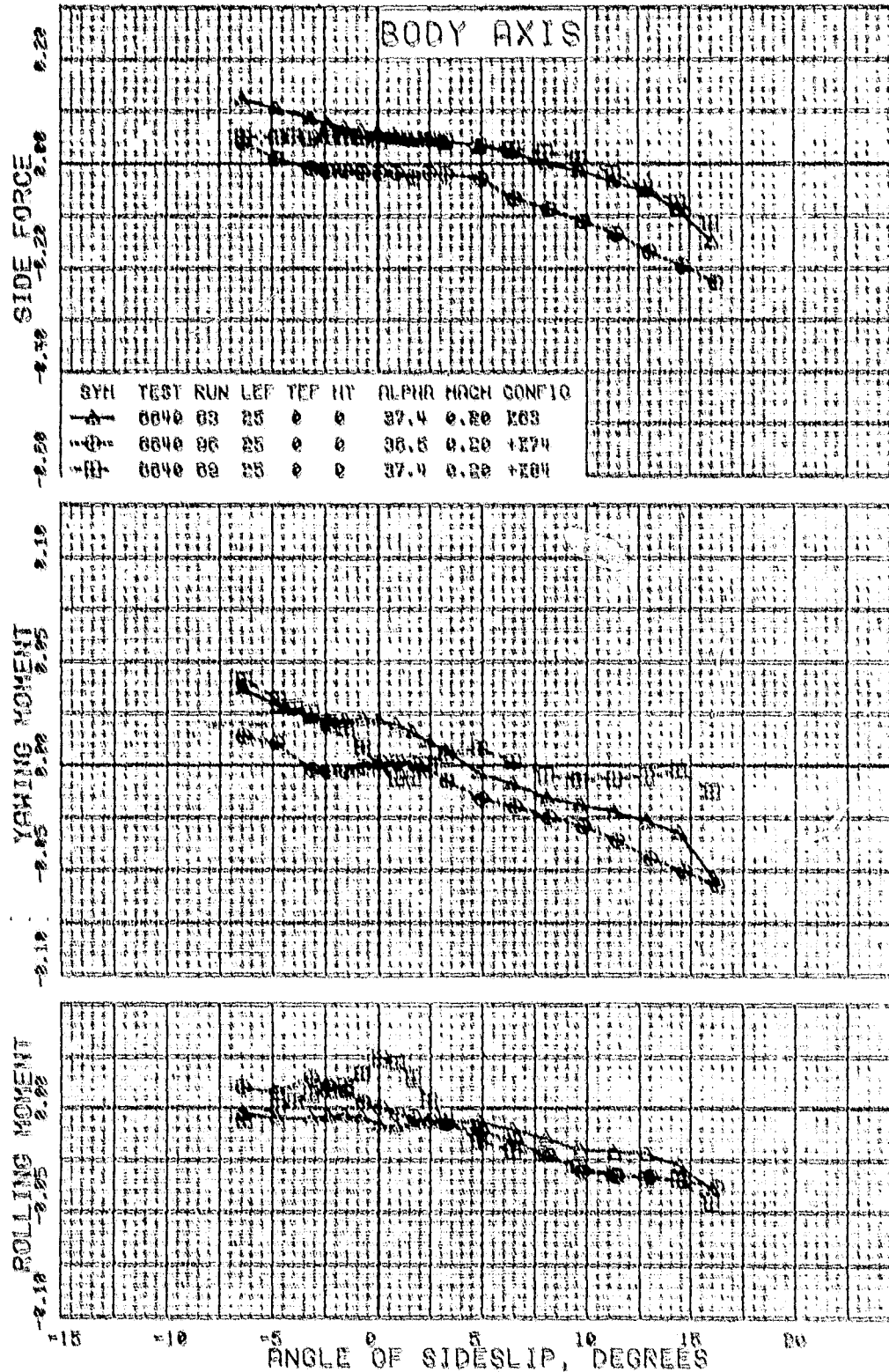
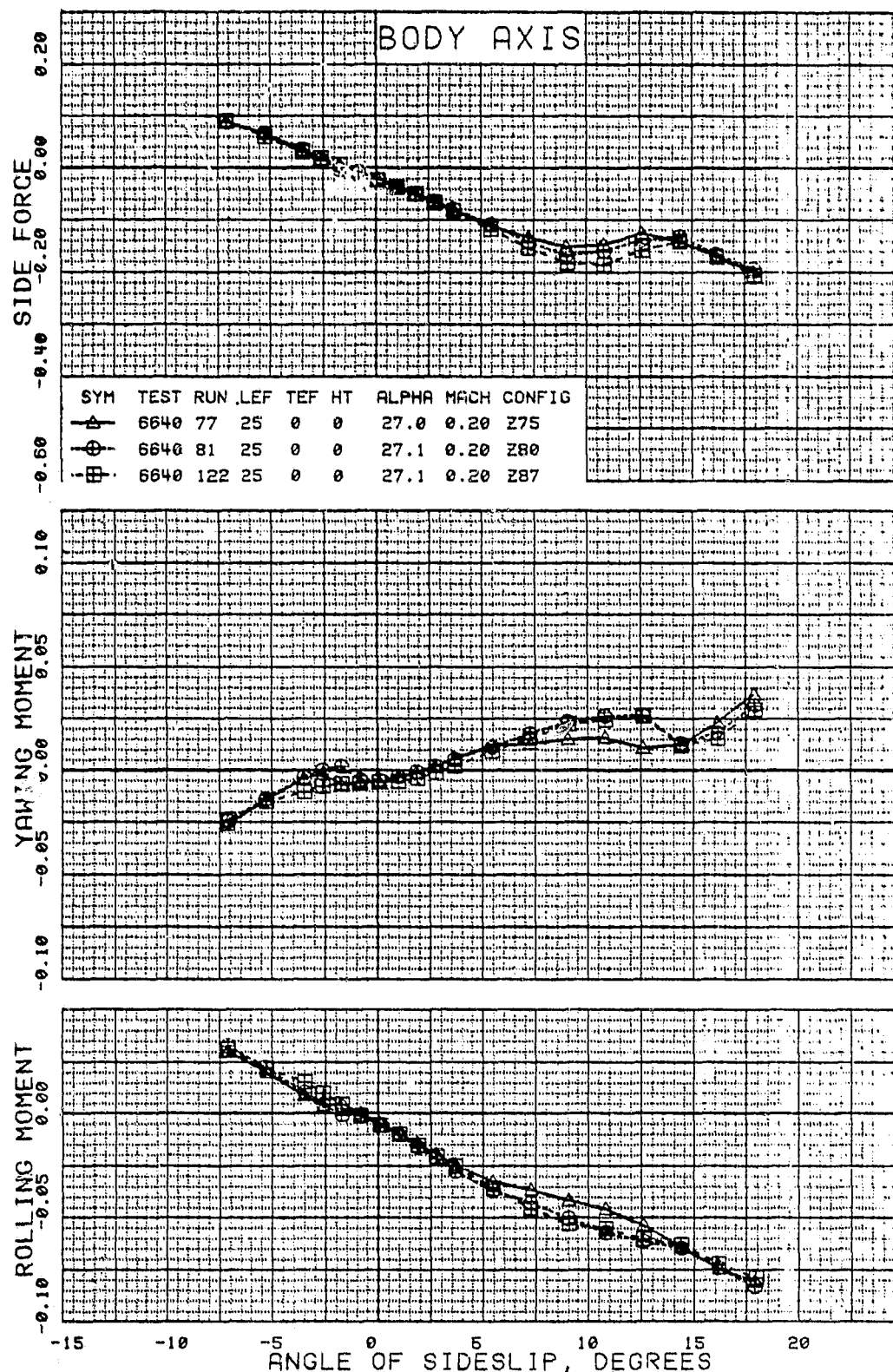


Figure 2-11 (c) Force and Moments, $\alpha = 37^\circ$



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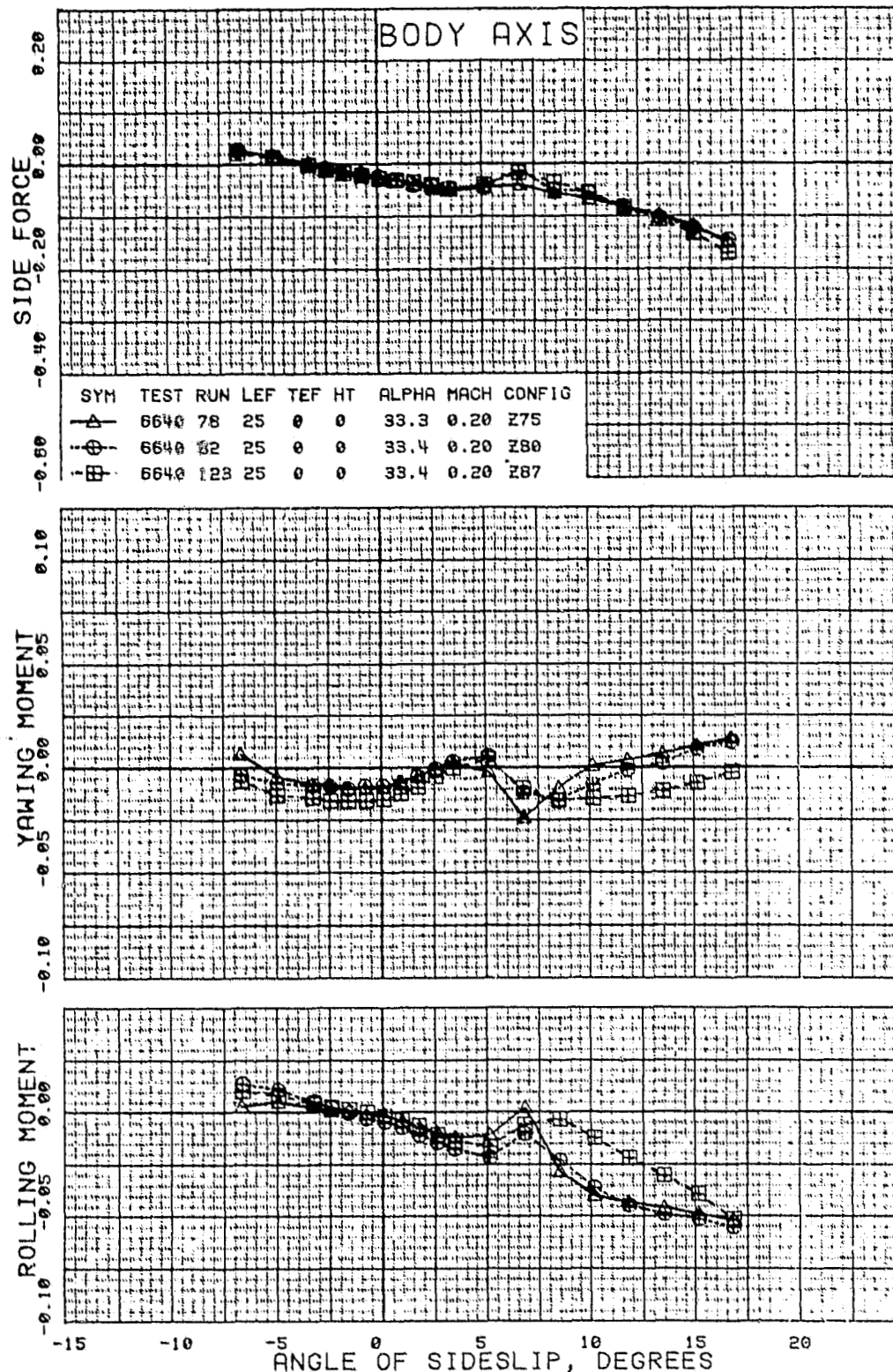


Figure 2-12 (b) Force and Moments, $\alpha=33^\circ$

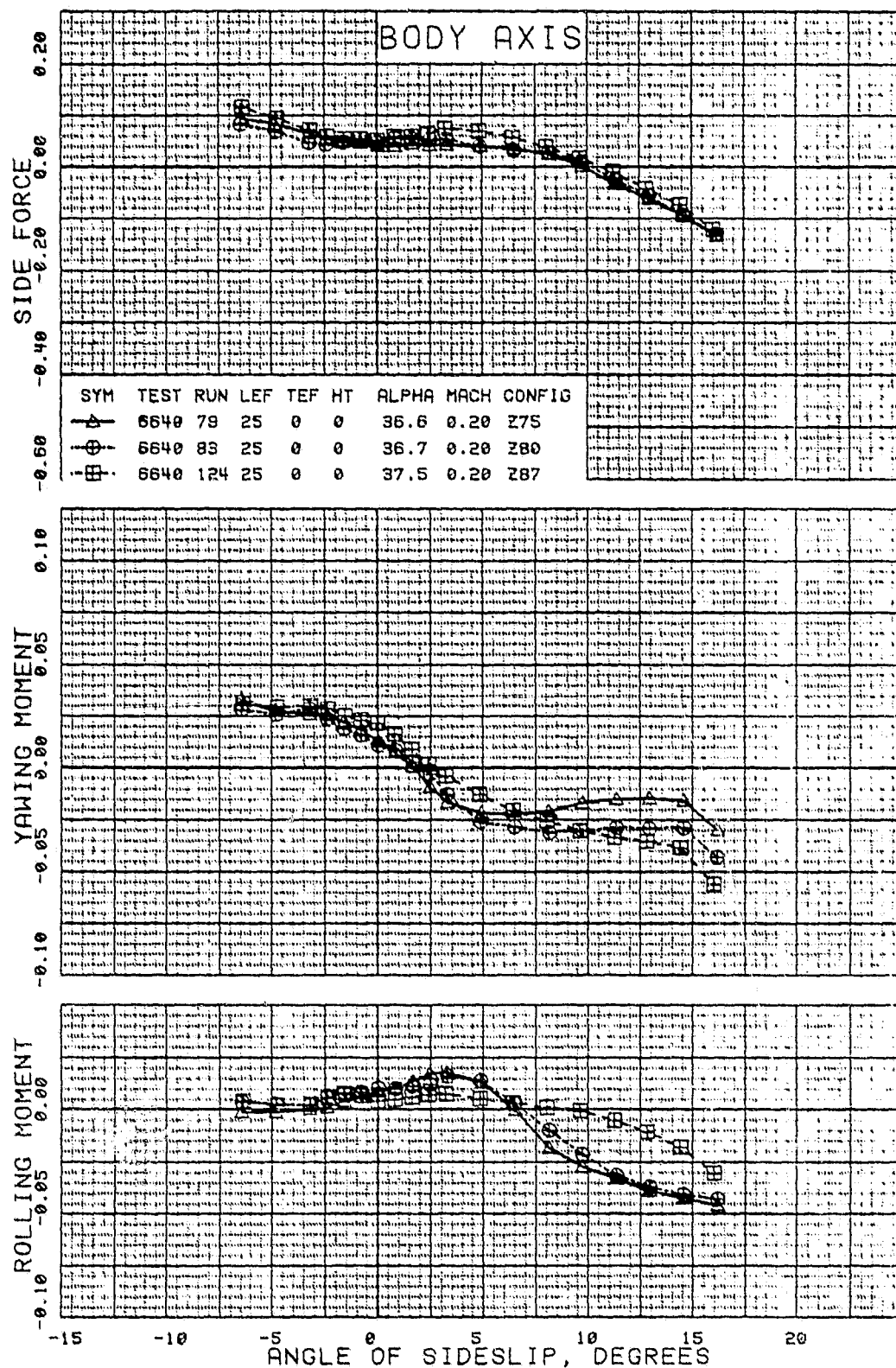


Figure 2-12 (c) Force and Moments, $\alpha=37^\circ$

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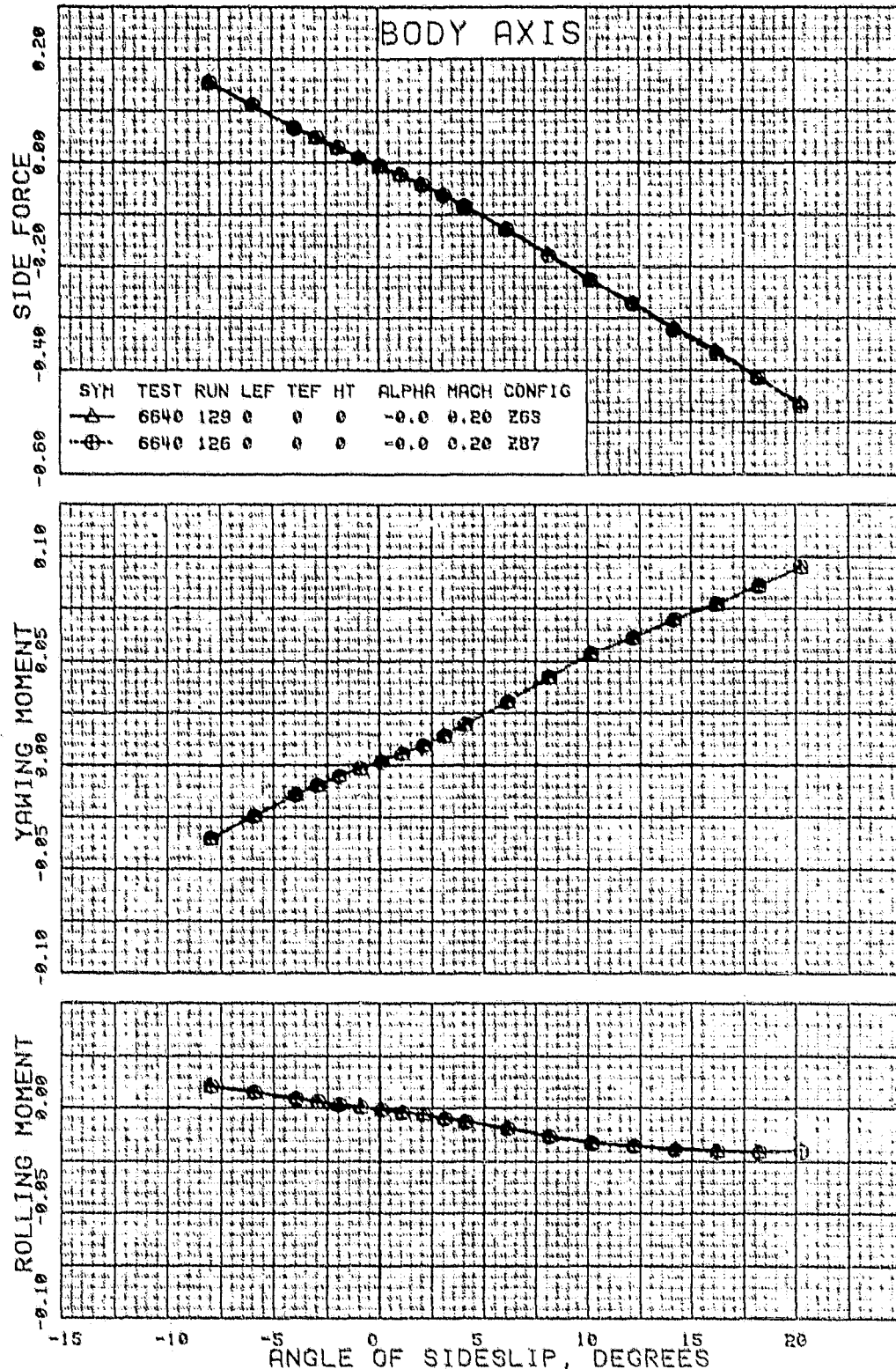


Figure 2-13 Effect of Forebody Strake Size
(Z63 and Z87), YF-16 +30.5 Stretch
(a) Force and Moments, $\alpha=0$

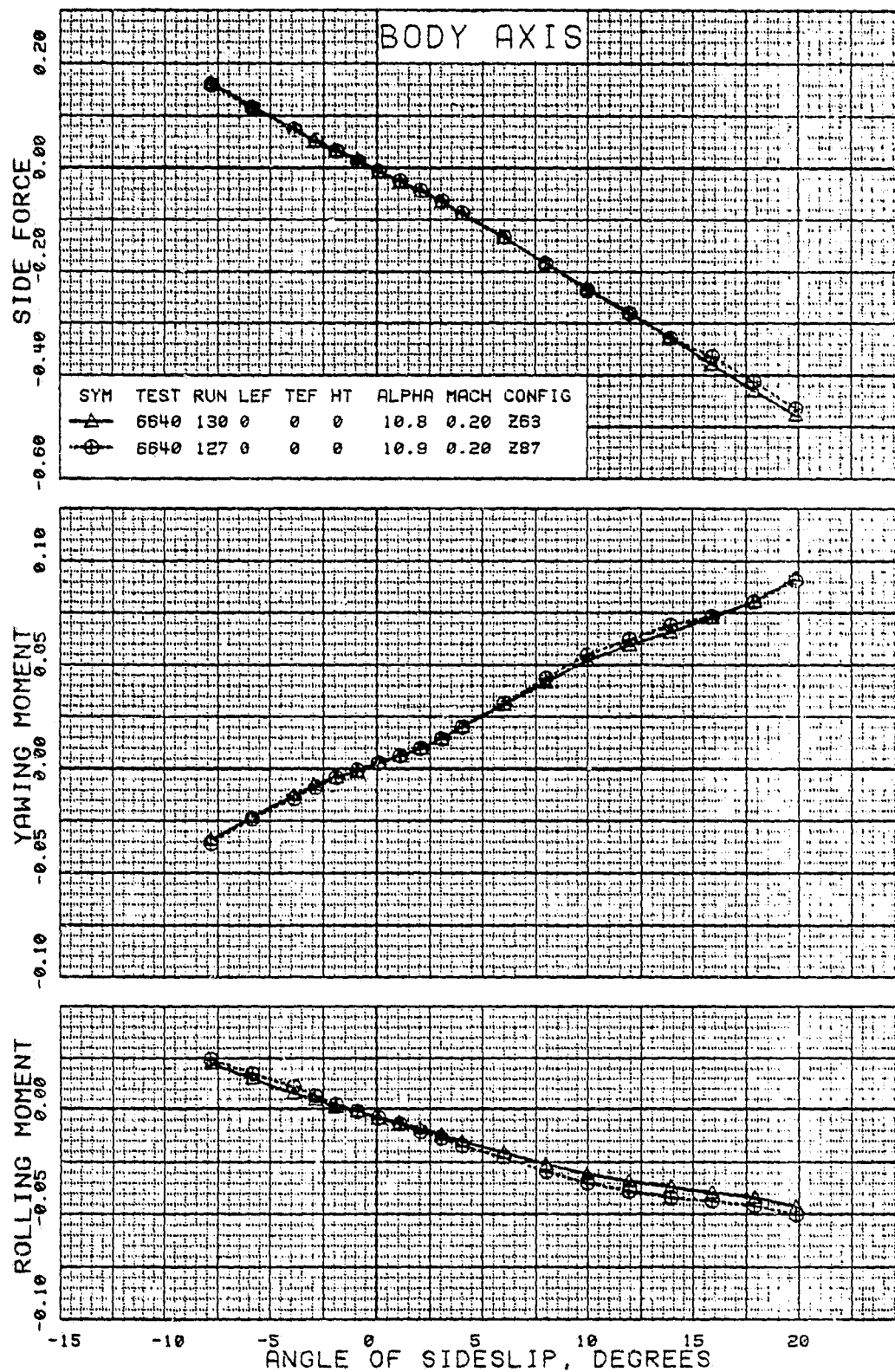


Figure 2-13 (b) Force and Moments, $\alpha = 11^\circ$

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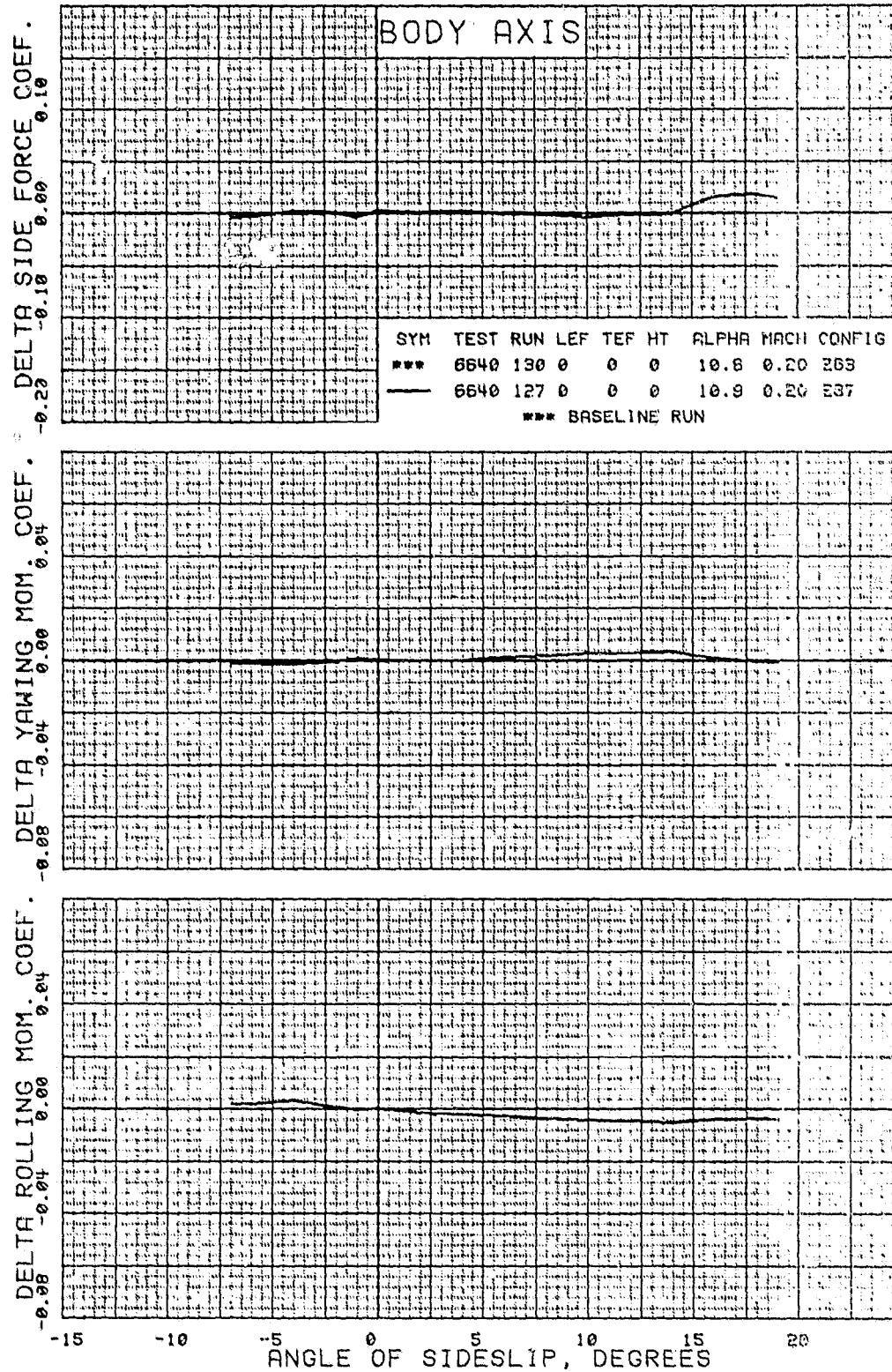


Figure 2-13 (c) Increments, $\alpha=11^\circ$

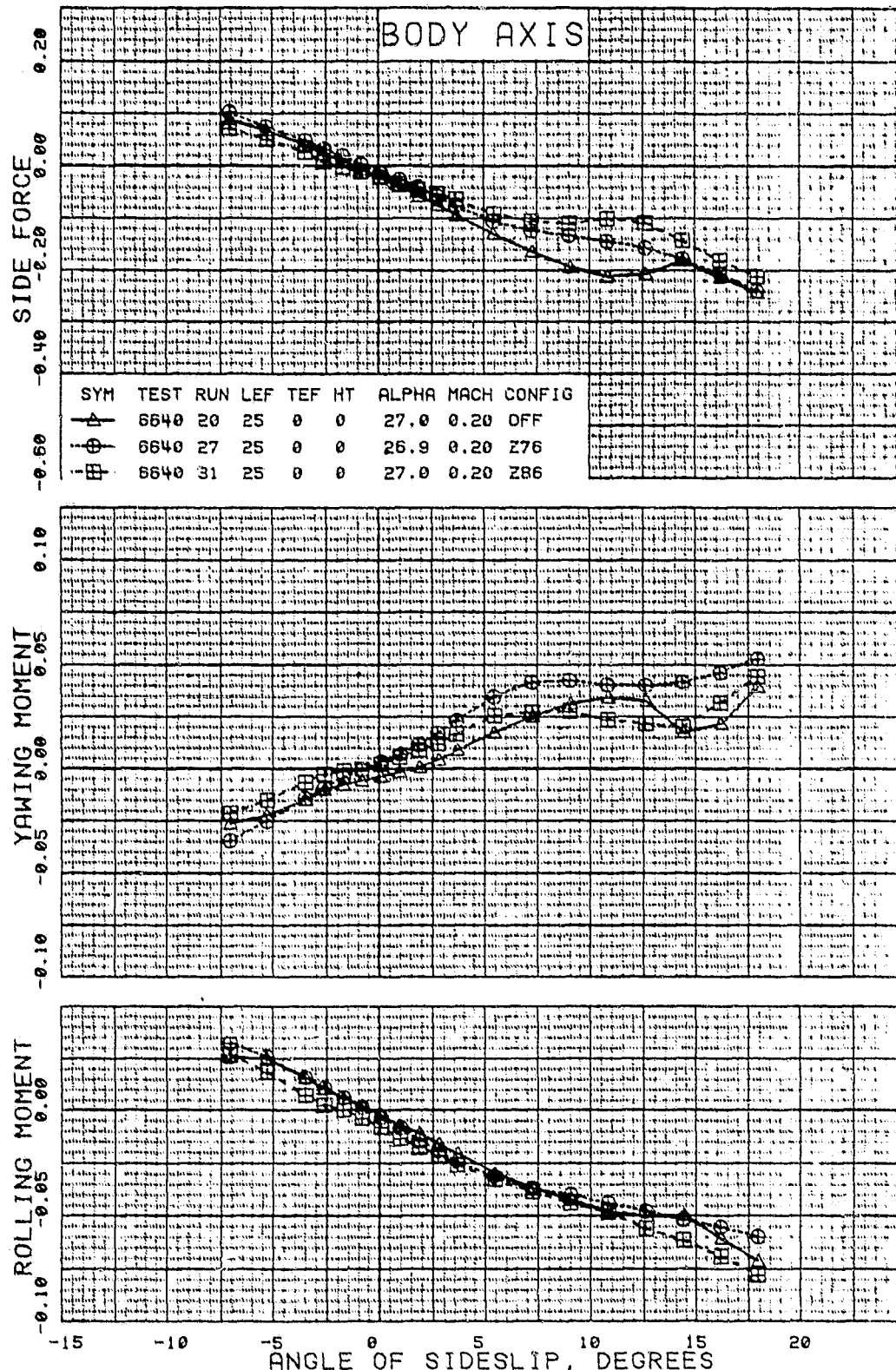


Figure 2-14 Effect of Nose, Z76, and Canard, Z86, Strakes, YF-16
(a) Force and Moments, $\alpha=27^\circ$

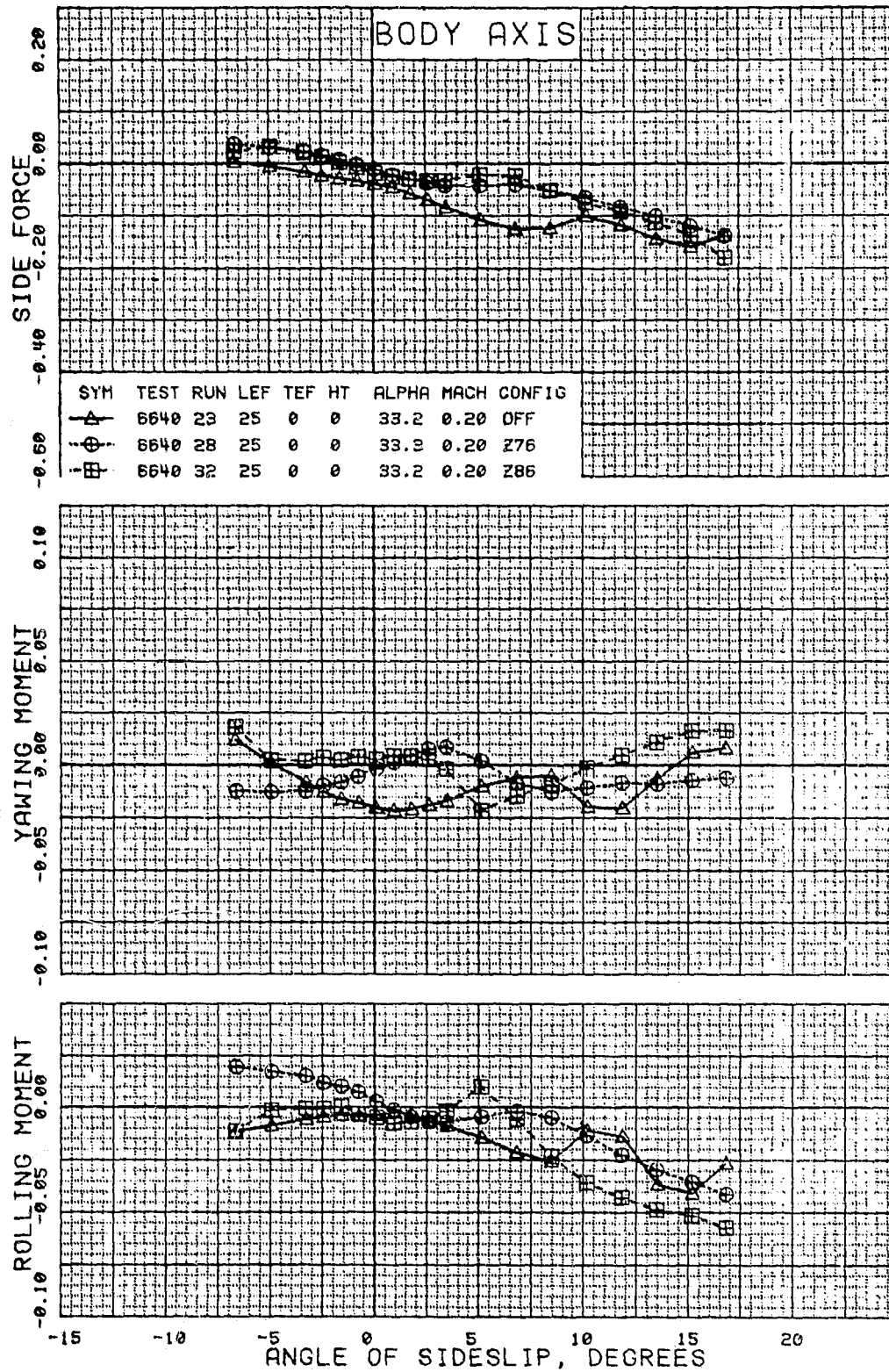
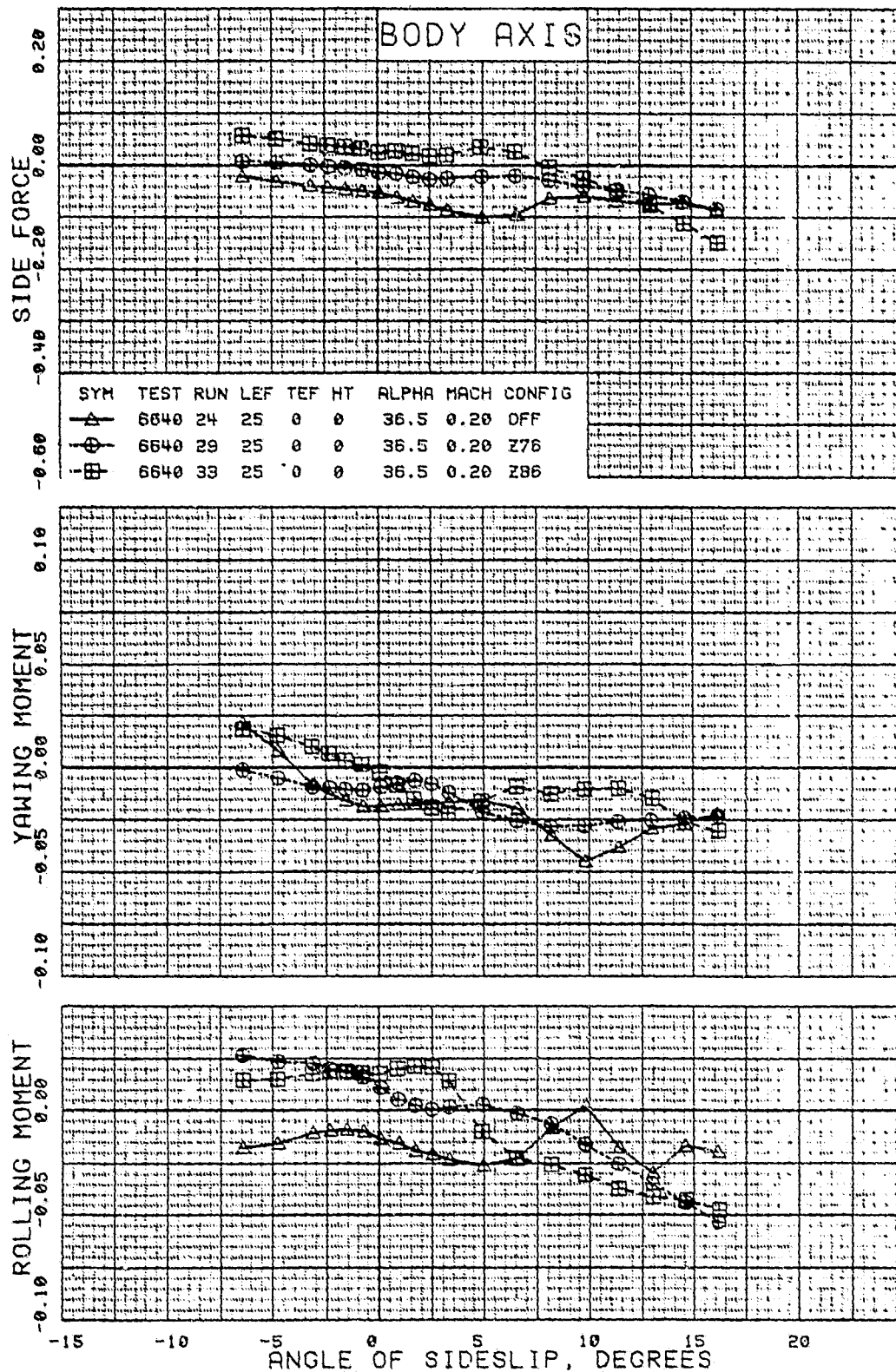


Figure 2-14 (b) Force and Moments, $\alpha=33^\circ$



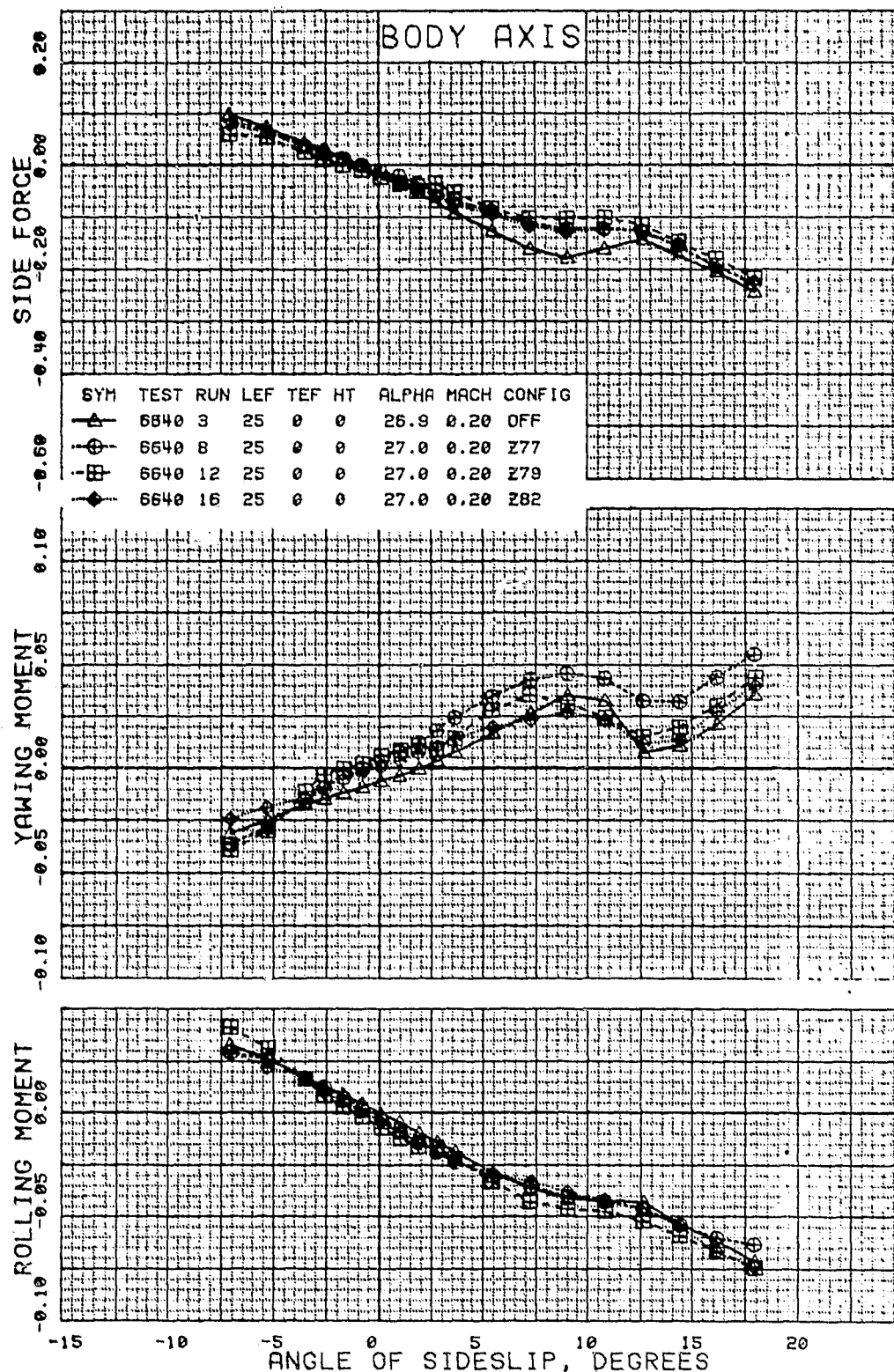


Figure 2-15 Effect of Nose (Z77) and Canard (Z79,Z82) Strakes, YF-16
(a) Force and Moments, $\alpha=27^\circ$

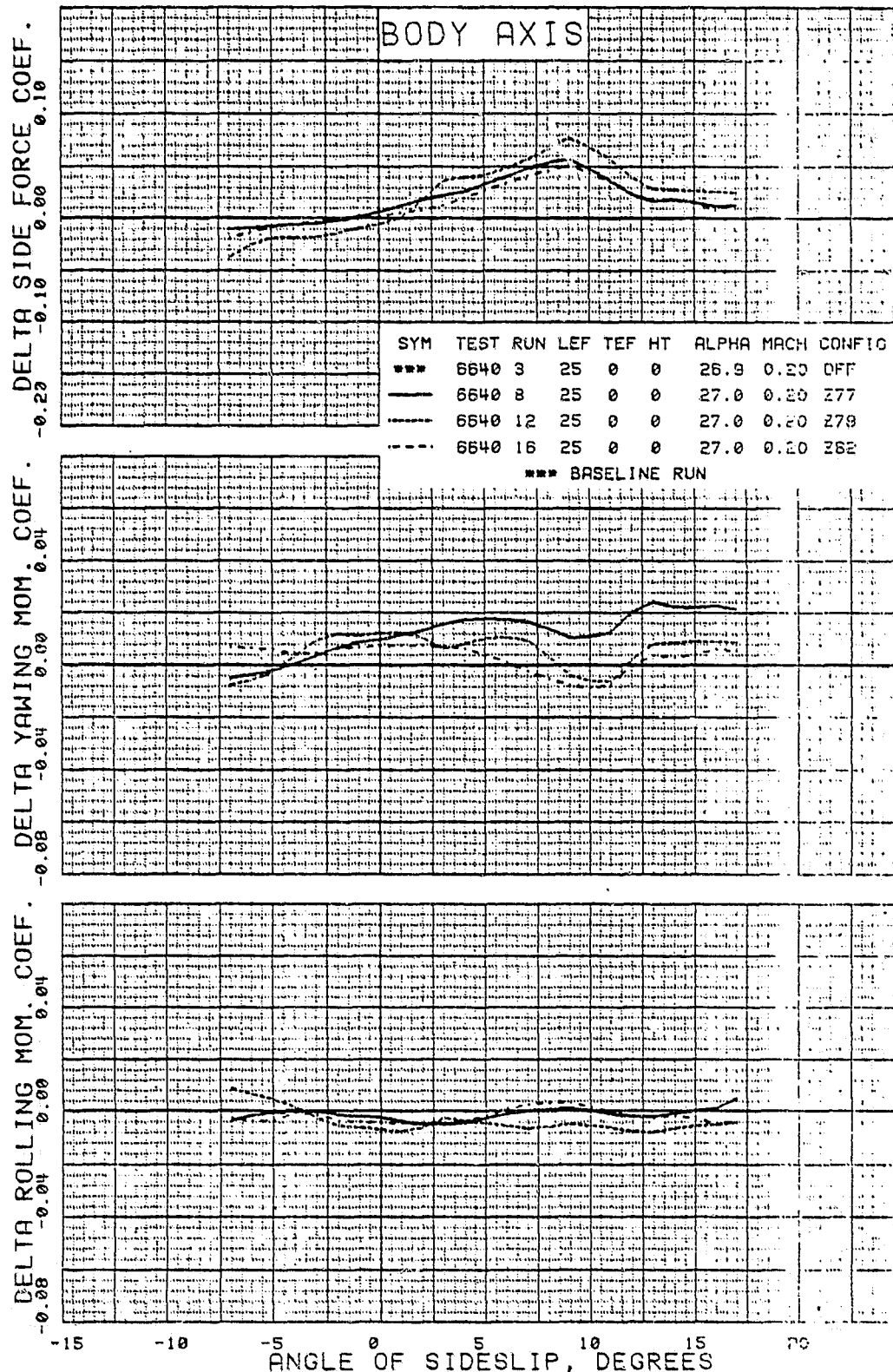


Figure 2-15 (b) Increments, $\alpha=27^\circ$

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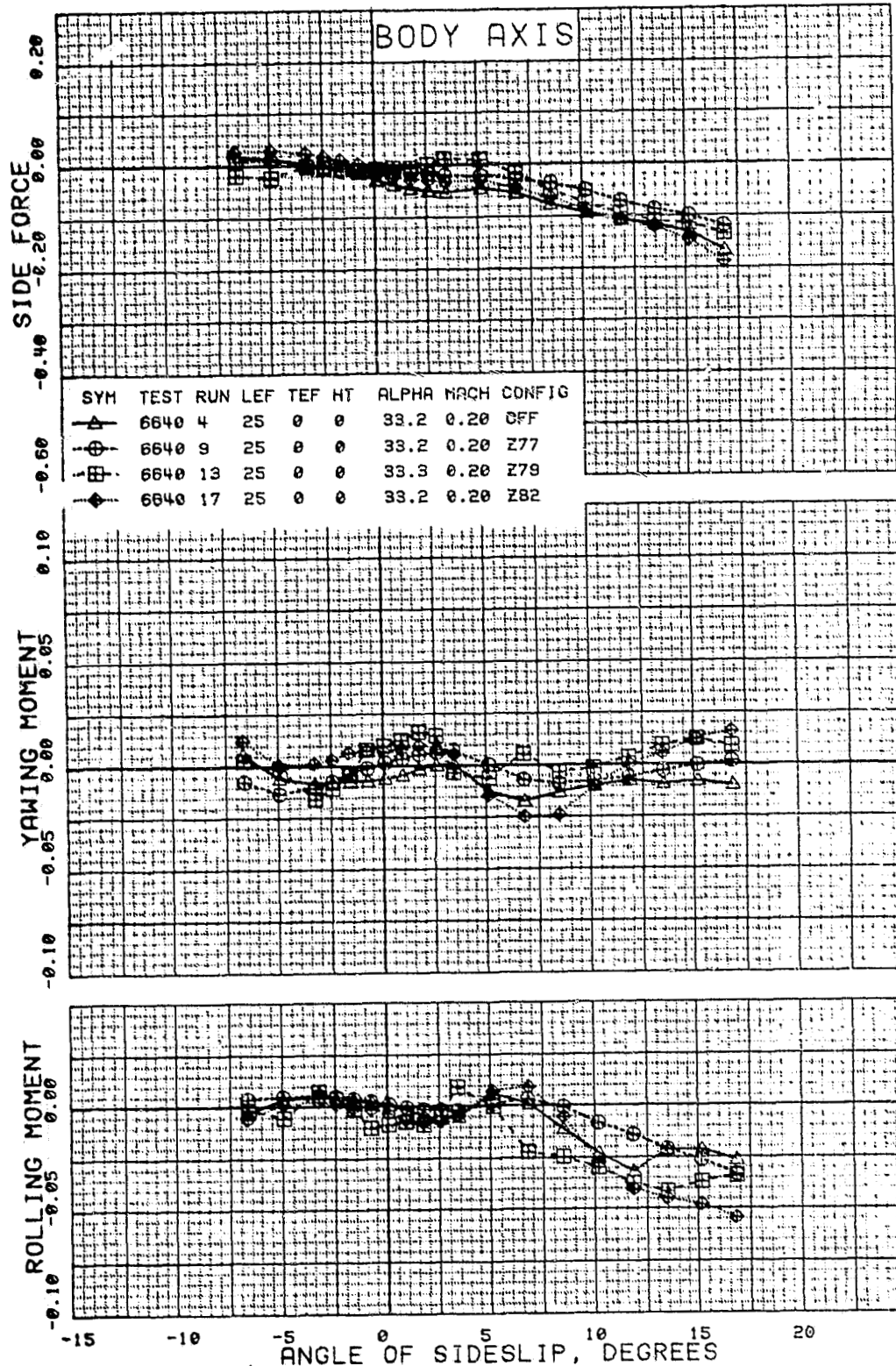


Figure 2-15 (c) Force and Moments, $\alpha=33^\circ$

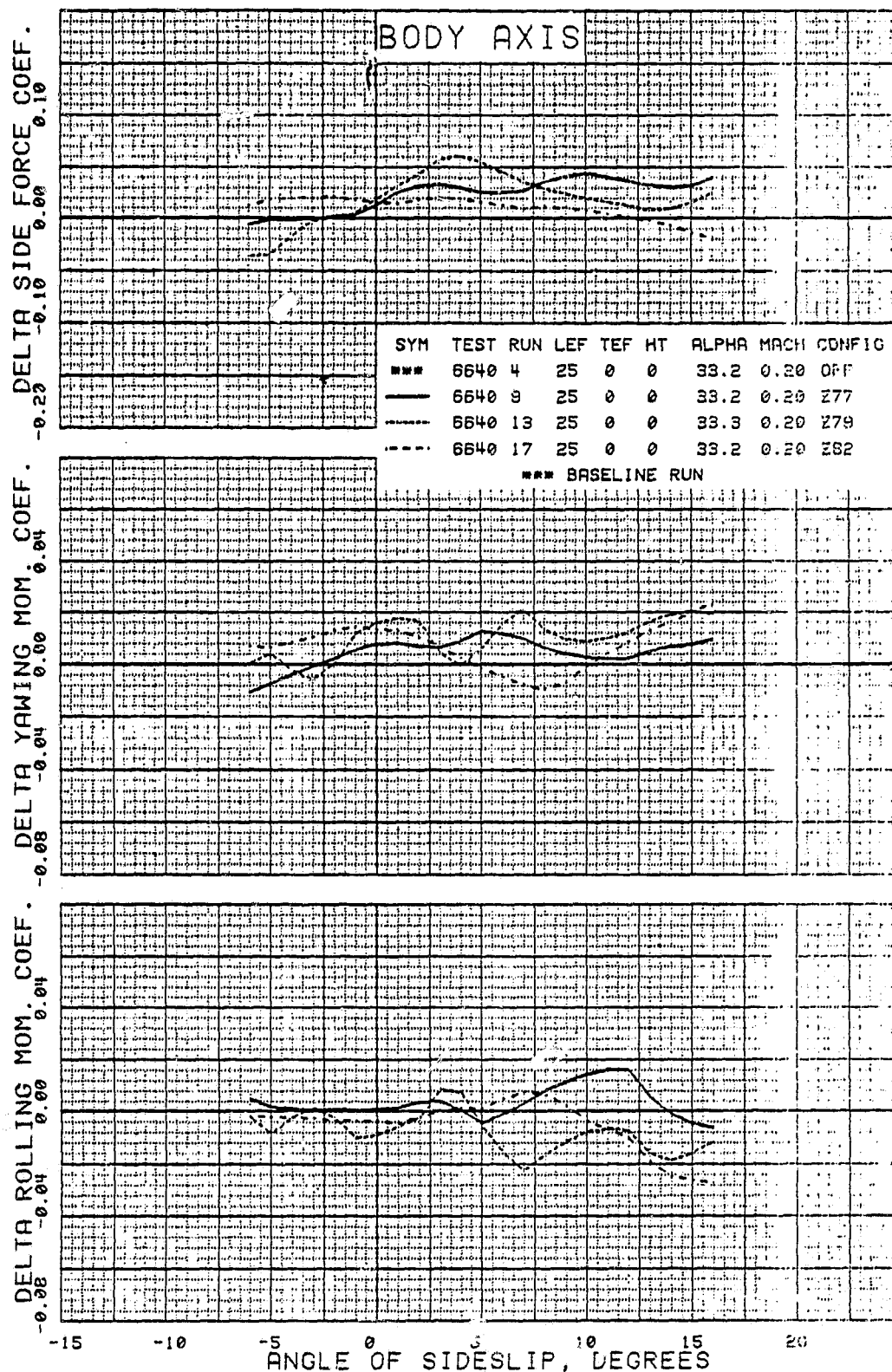


Figure 2-15 (d) Increments, $\alpha = 33^\circ$

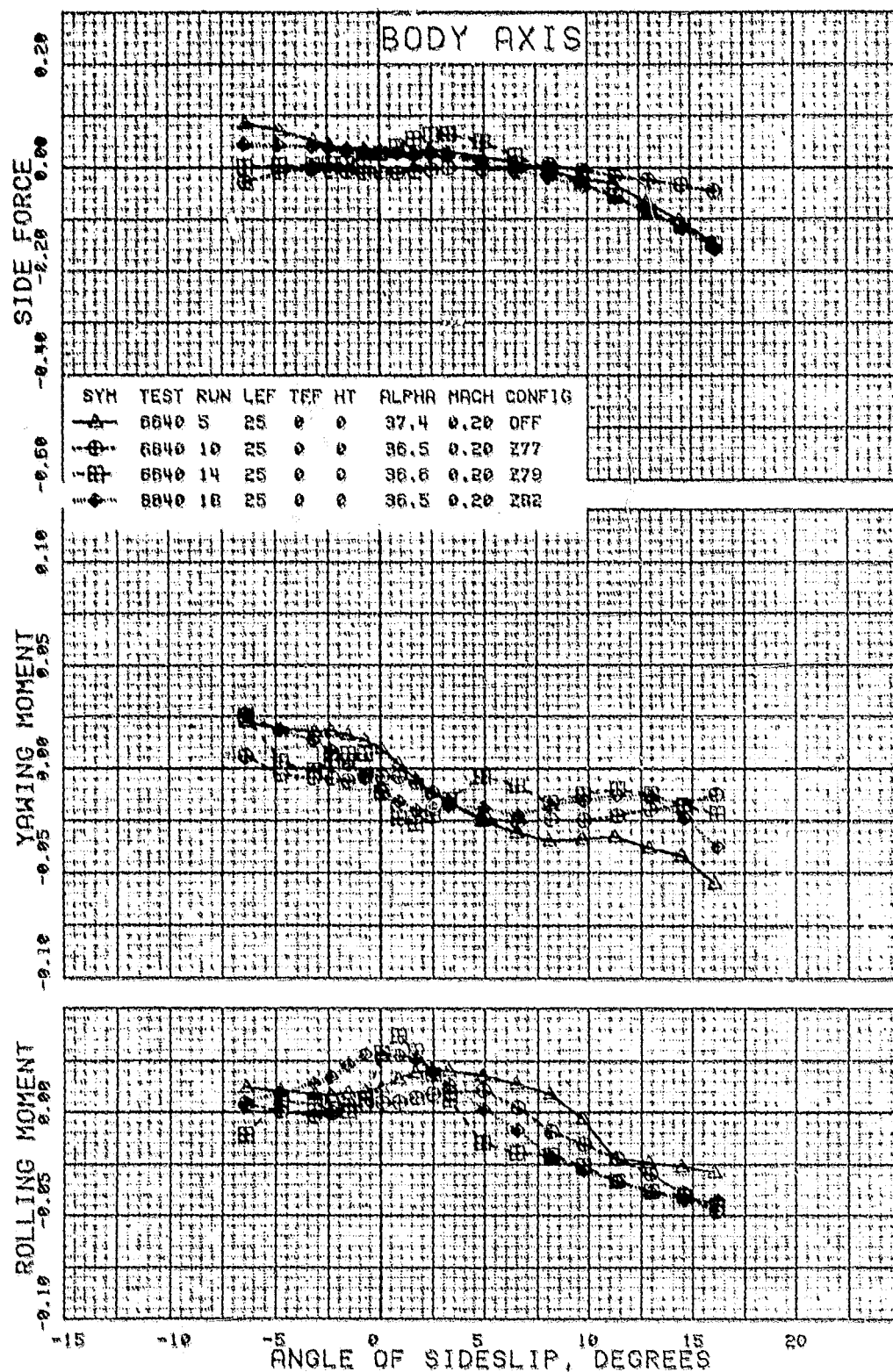


Figure 2-15 (e) Force and Moments, $\alpha = 37^\circ$

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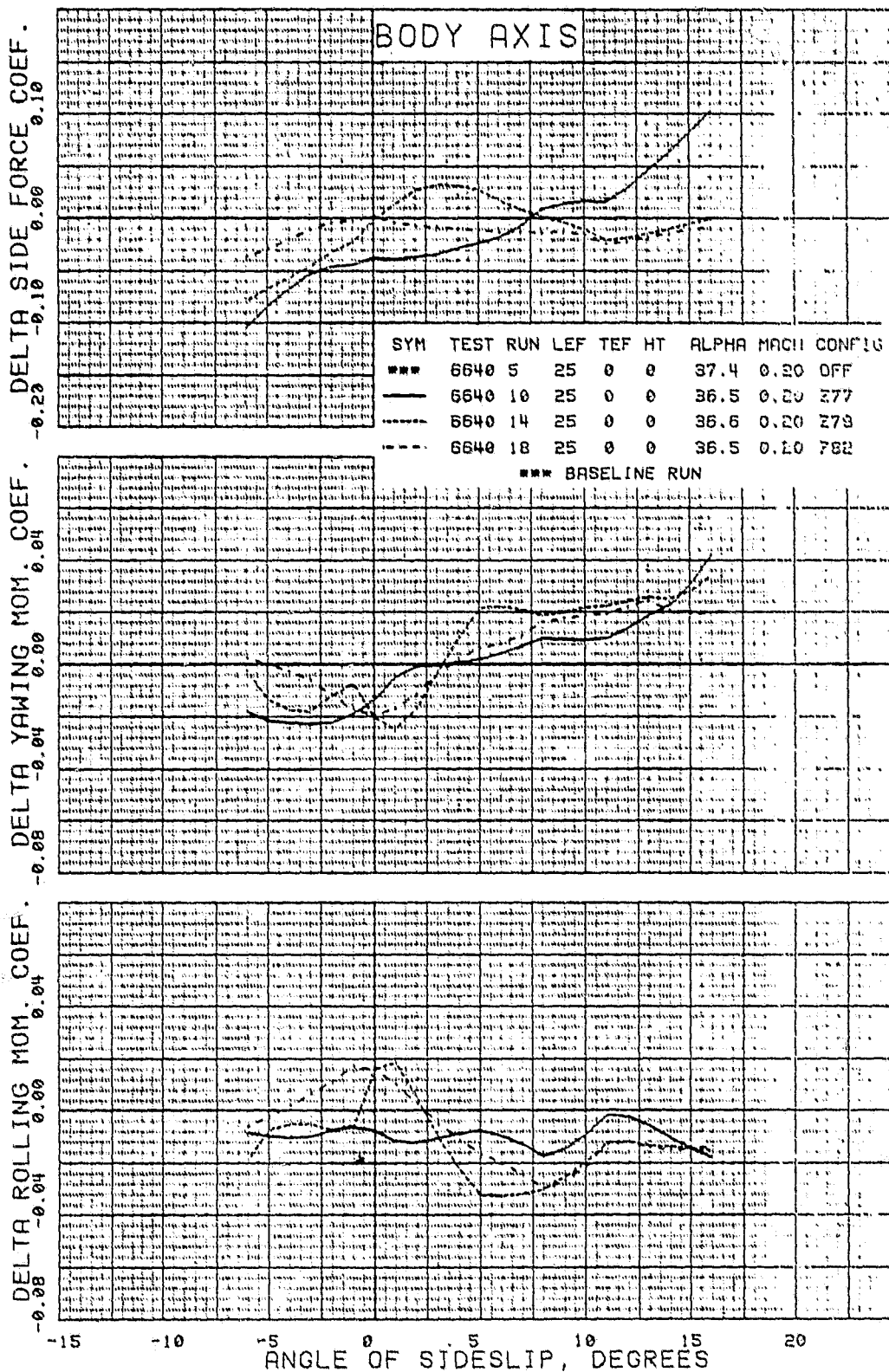


Figure 2-15 (f) Increments, $\alpha=37^\circ$

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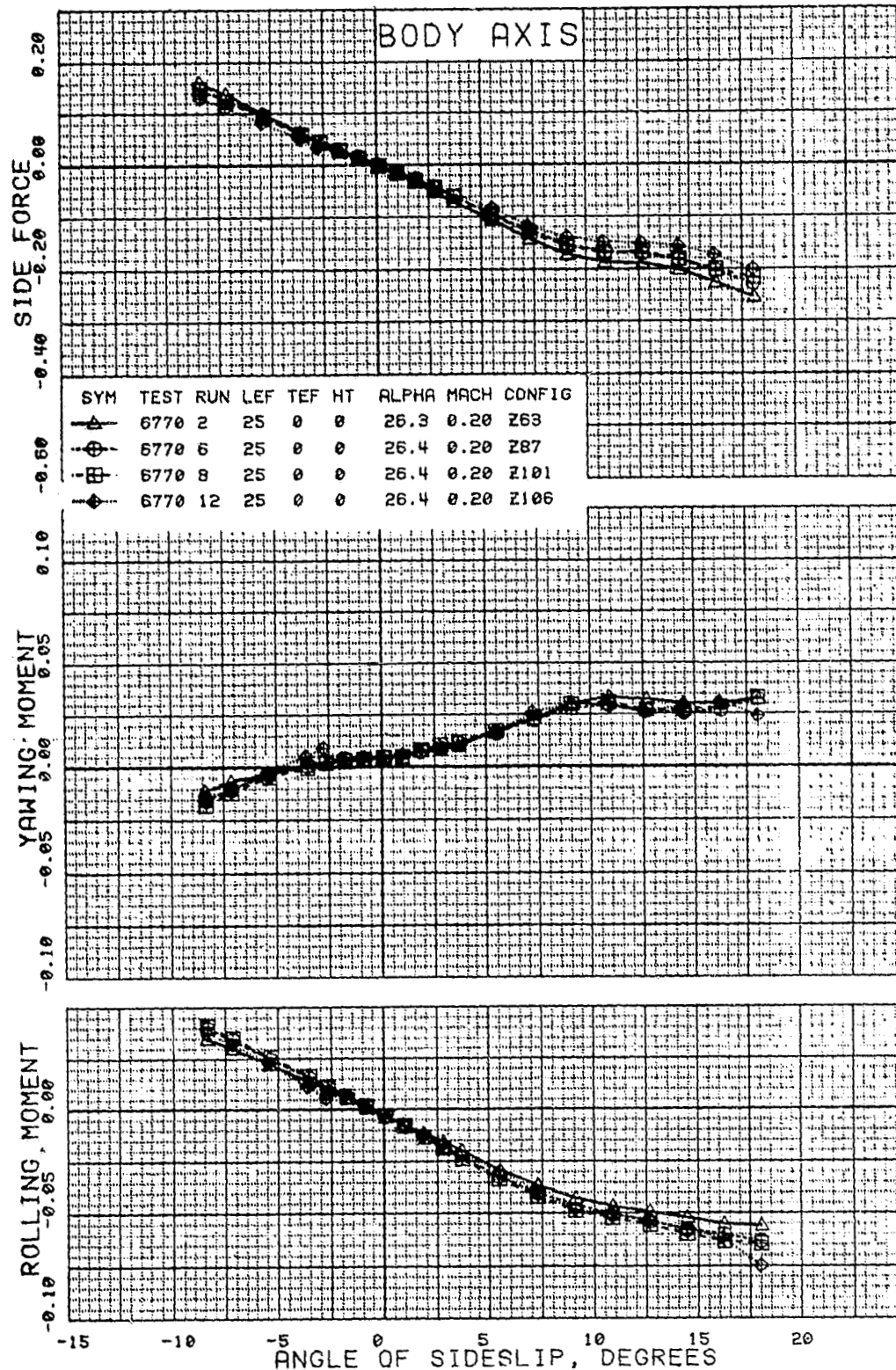


Figure 2-16 Effect of Forebody Strake Forward Extent
(Z63,Z87,Z101,Z106), YF-16+30.5 Stretch
(a) Force and Moments. $\alpha = 26^\circ$

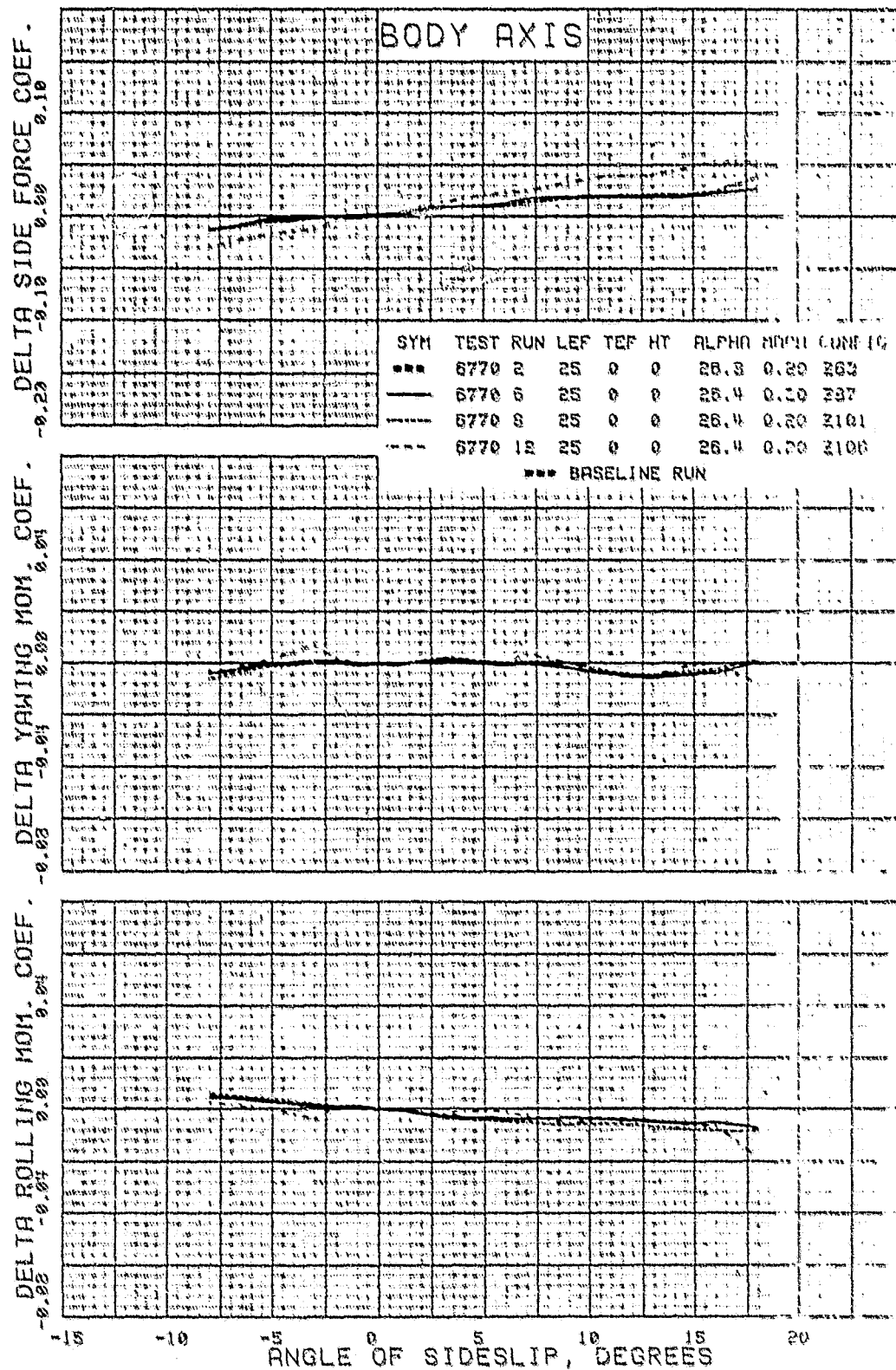


Figure 2-16 (b) Increments, $\alpha = 26^\circ$

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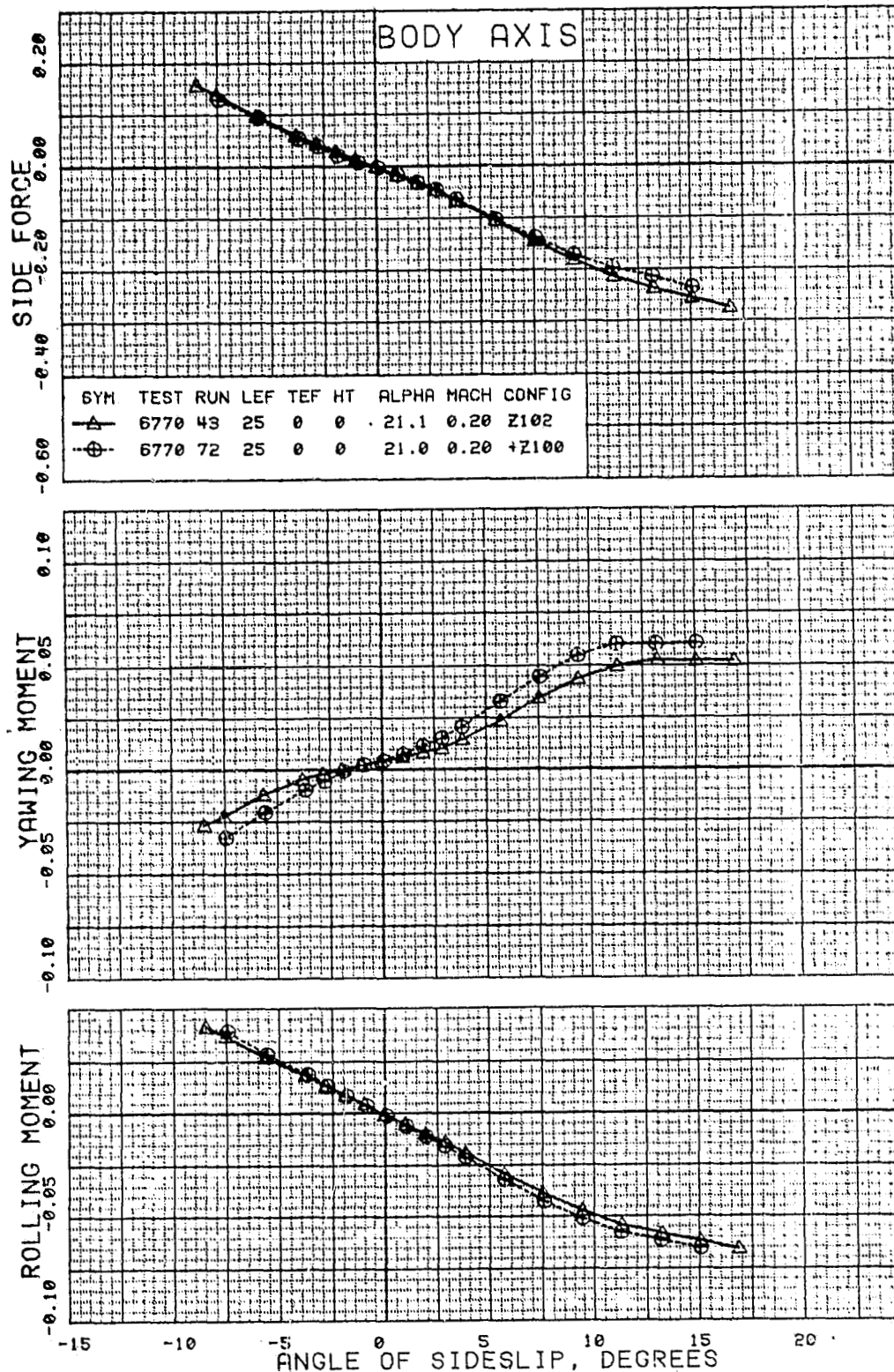


Figure 2-17 Effect of Nose Strake Z100, YF-16
(a) Force and Moments, $\alpha = 21^\circ$

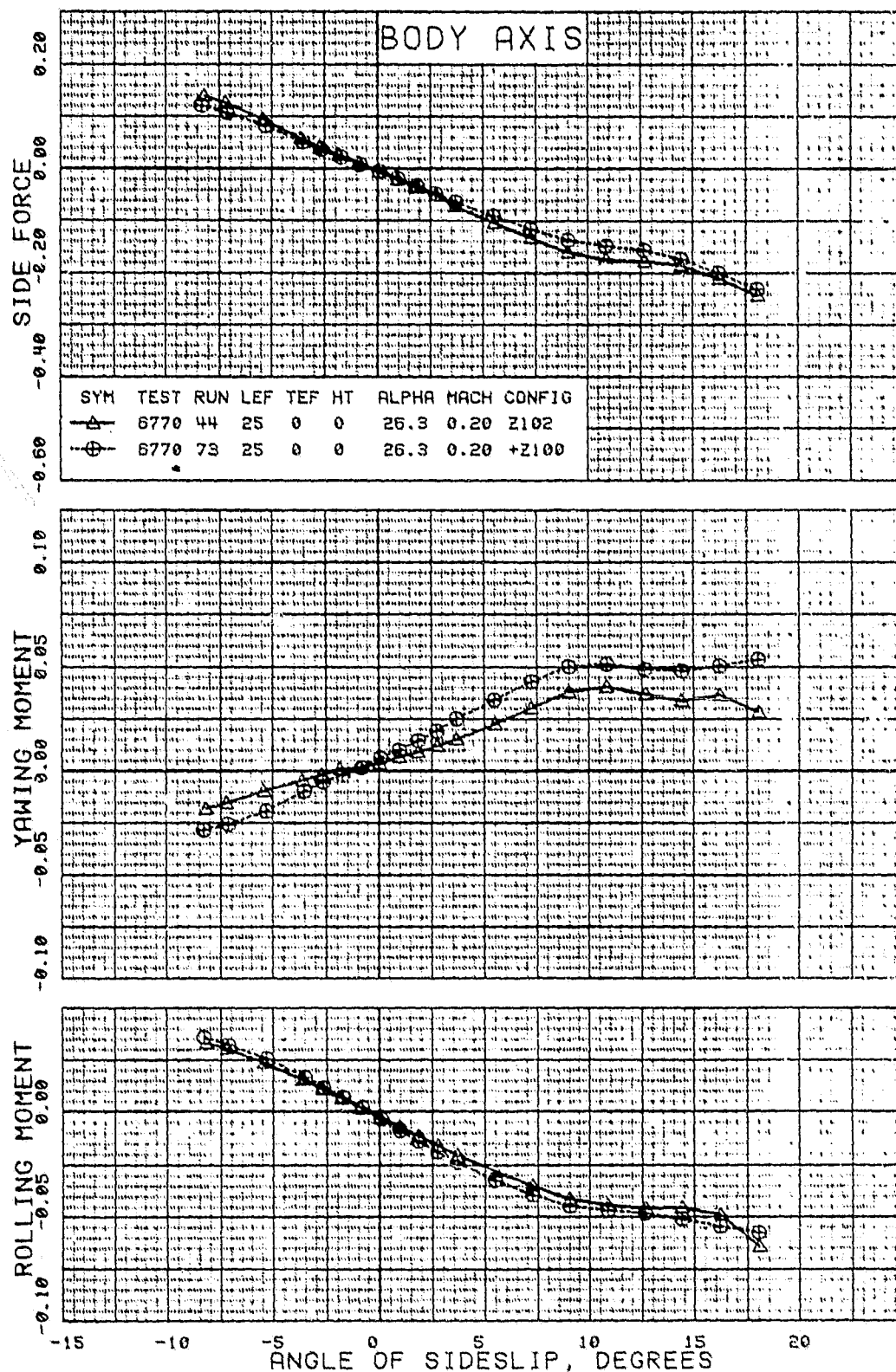


Figure 2-17 (b) Force and Moments, $\alpha=26^\circ$

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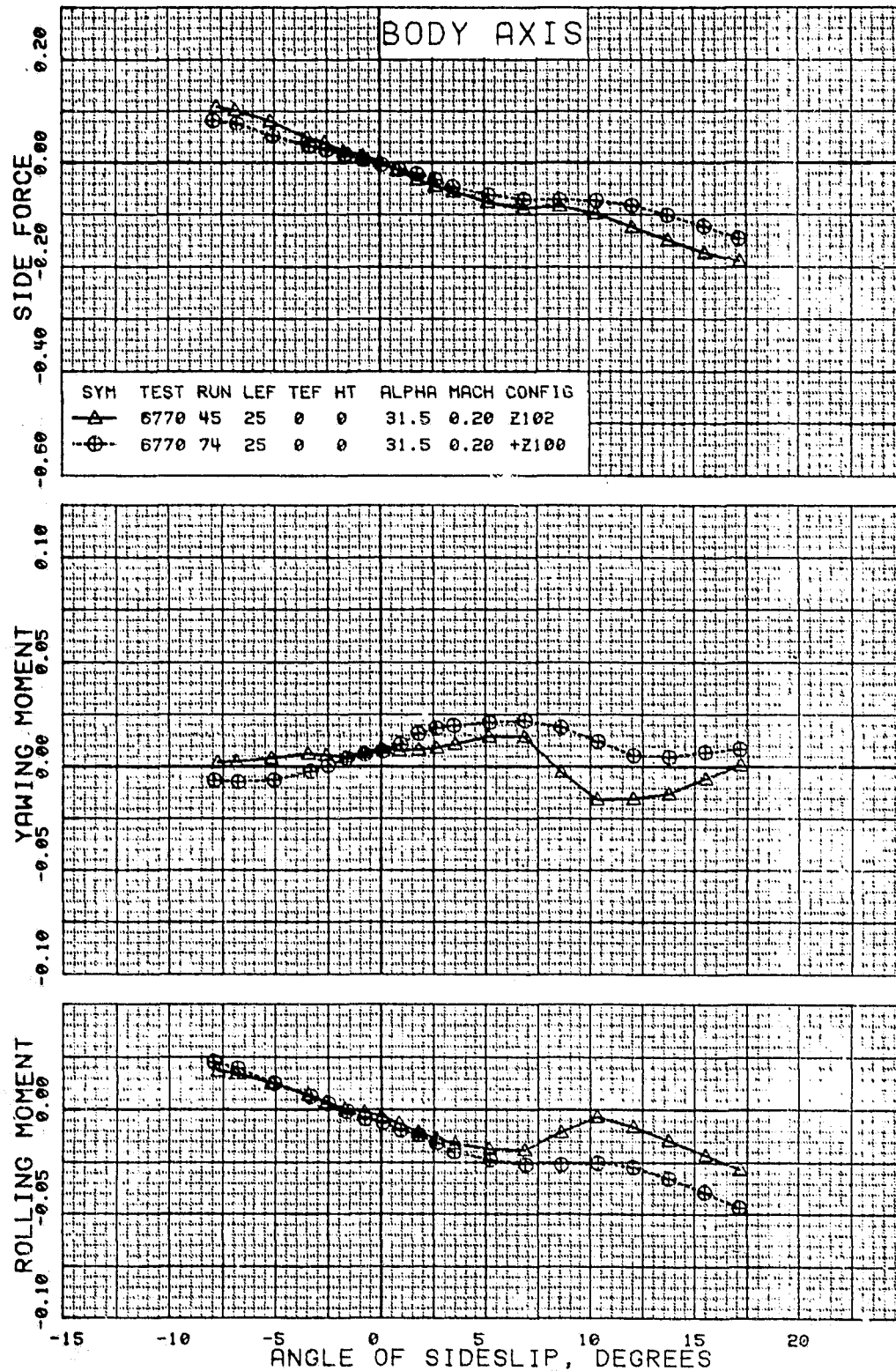


Figure 2-17 (c) Force and Moments, $\alpha = 32^\circ$

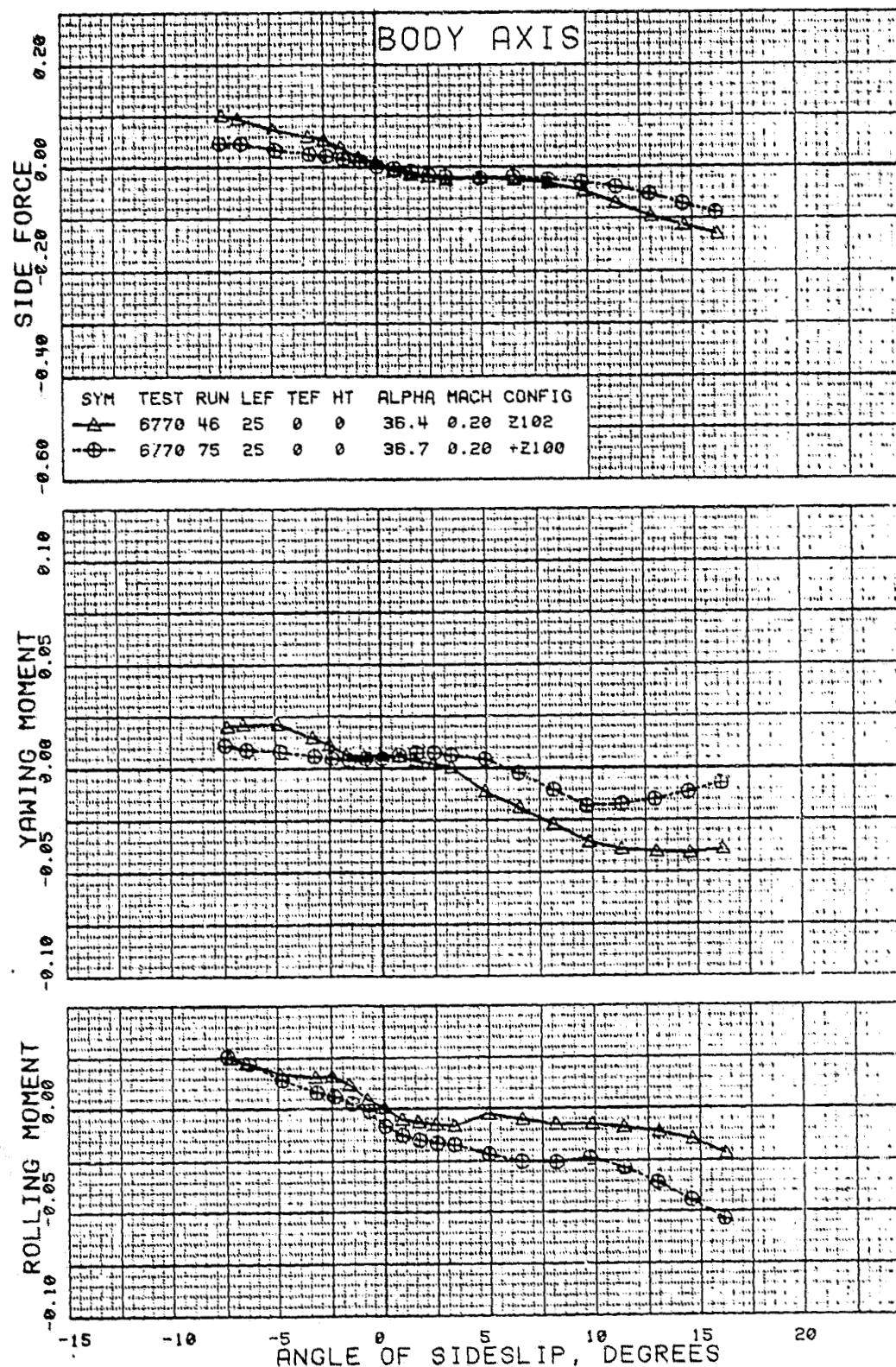


Figure 2-17 (d) Force and Moments, $\alpha = 37^\circ$

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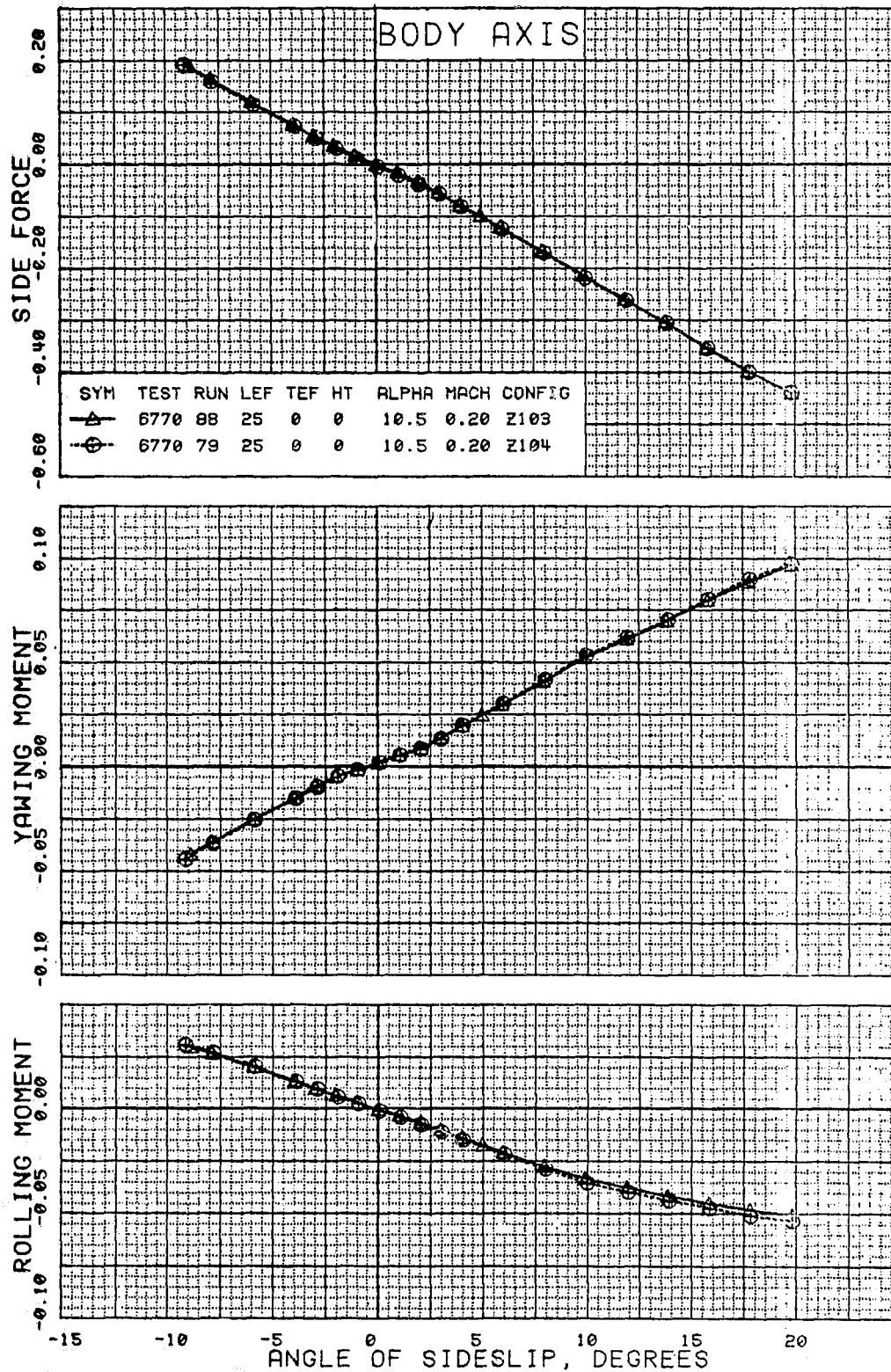


Figure 2-18 Effect of Forebody Strake Size (Z103-Z105),
F-16 with Wing W3BB
(a) Force and Moments, $\alpha=11^\circ$

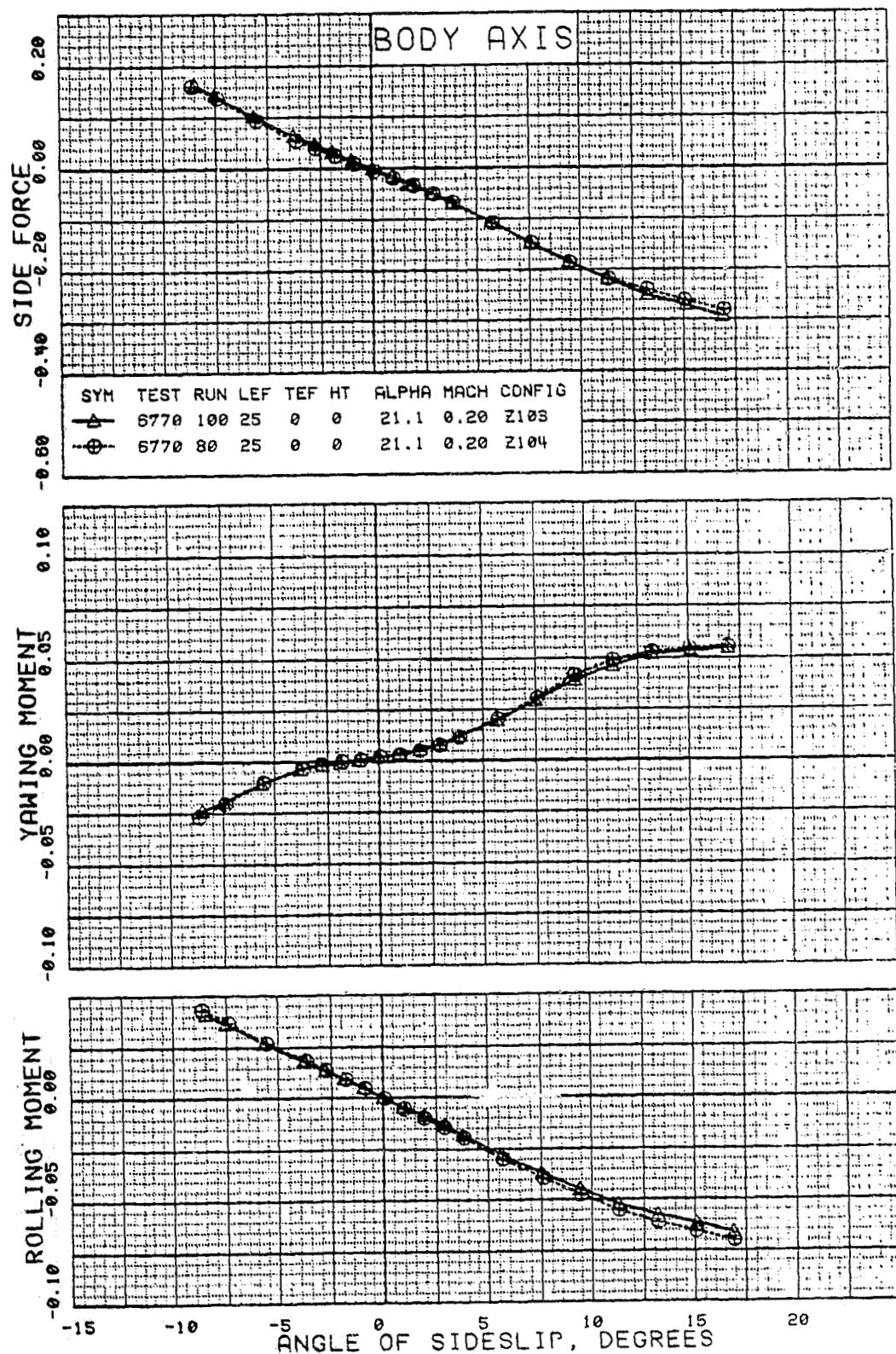


Figure 2-18 (b) Force and Moments, $\alpha=21^\circ$

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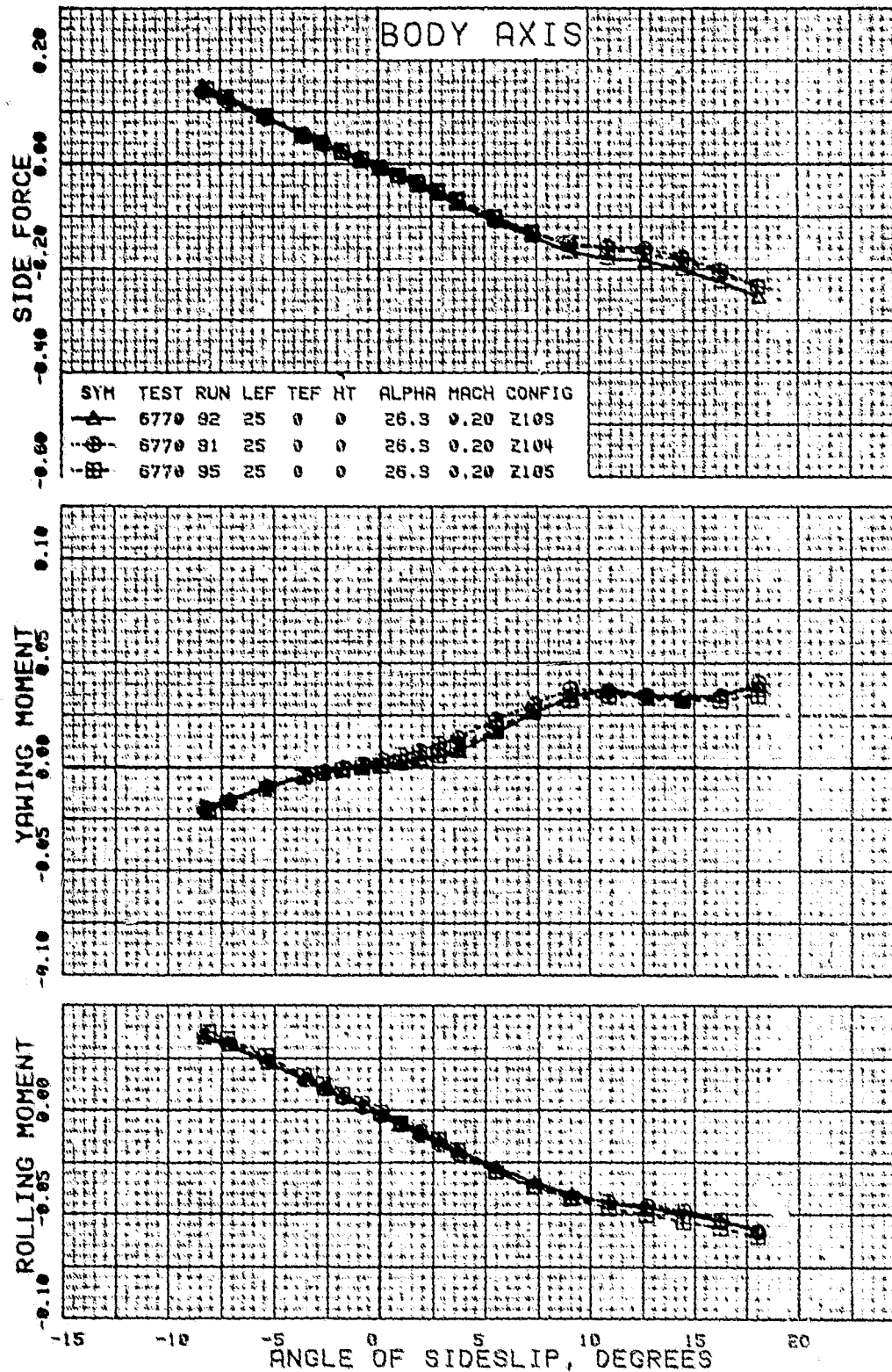


Figure 2-18 (c) Force and Moments, $\alpha=26^\circ$

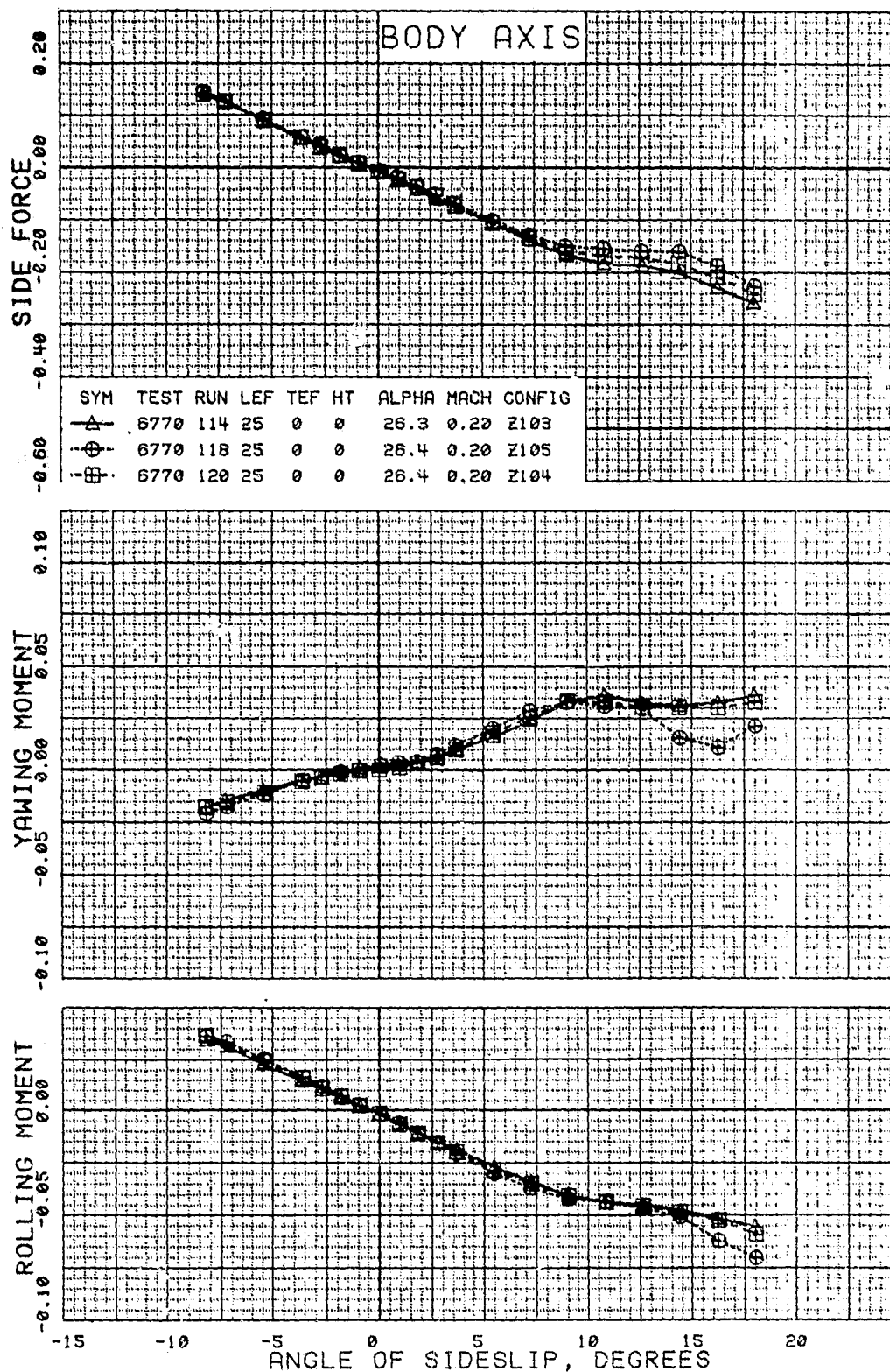


Figure 2-19 Effect of Forebody Strake Size (Z103-Z105), F-16 with Wing W24

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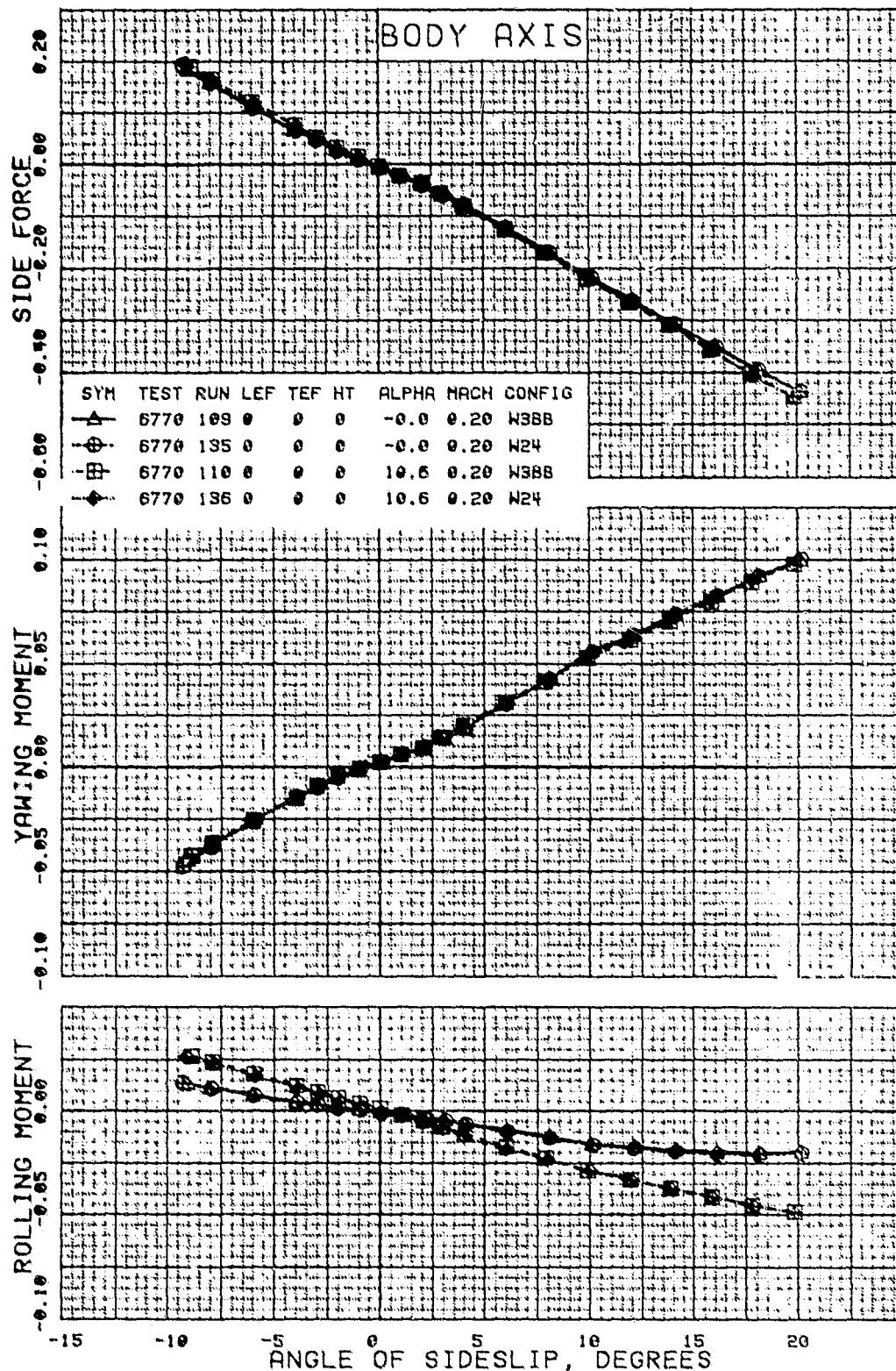


Figure 2-20 Effect of Wing with Forebody Strake Z103, F-16
(a) Force and Moments, $\alpha=0$ and 11°

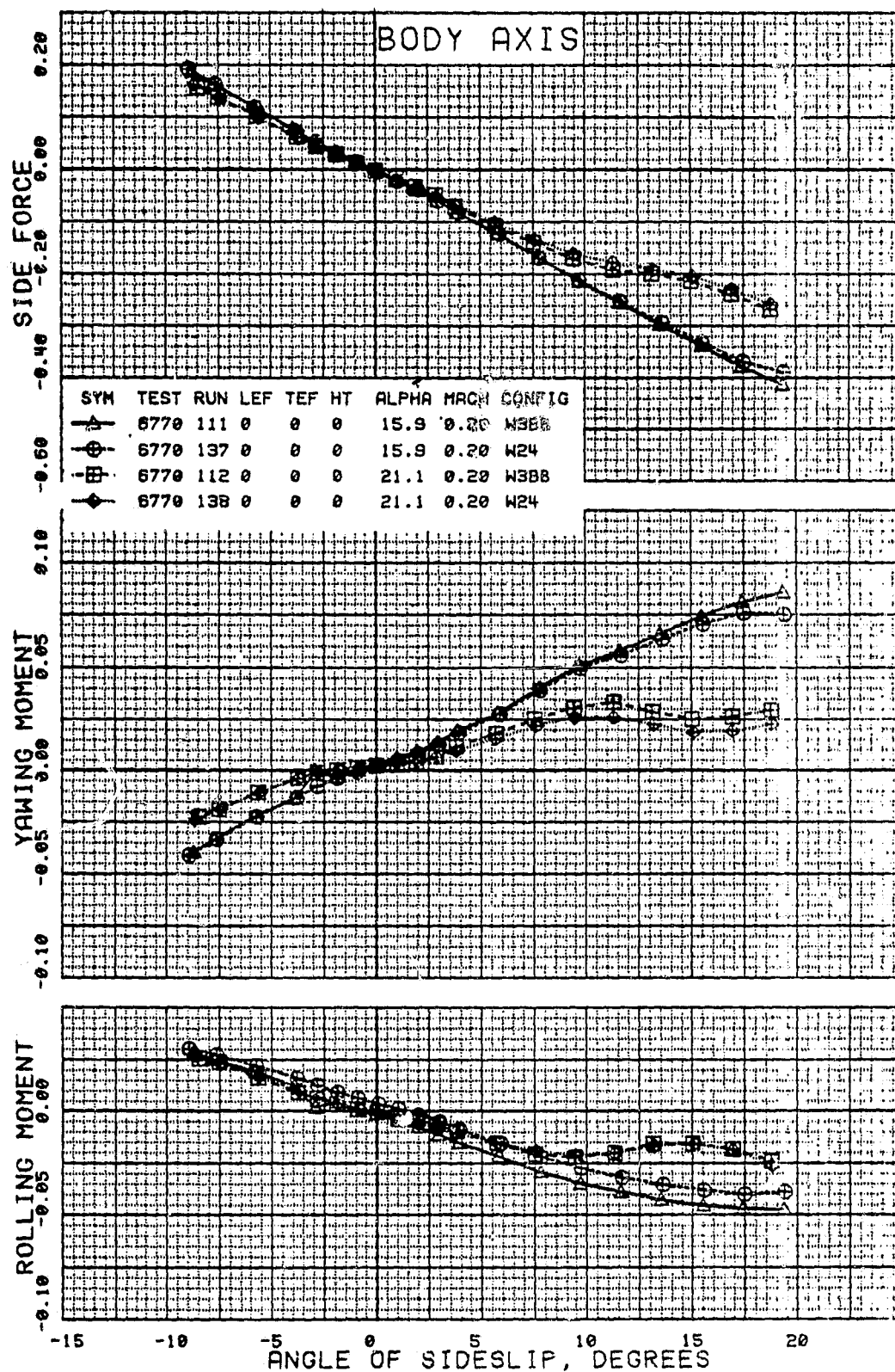


Figure 2-20 (b) Force and Moments, $\alpha=16$ and 21°

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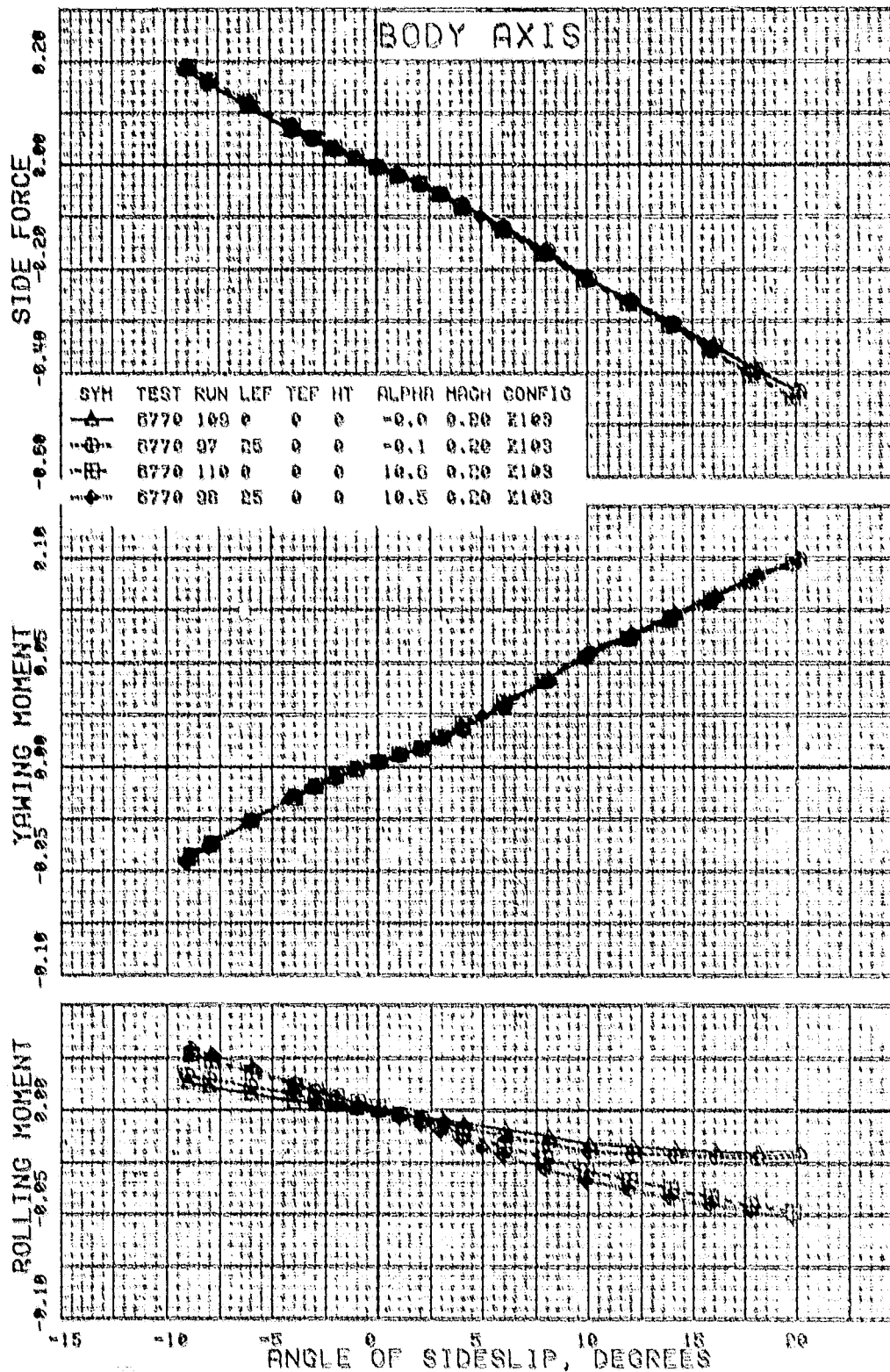


Figure 2-21 Effect of Leading Edge Flap Deflection with
Forebody Strake Z103, F-16 with Wing W3BB
(a) Force and Moments, $\alpha=0$ and 11°

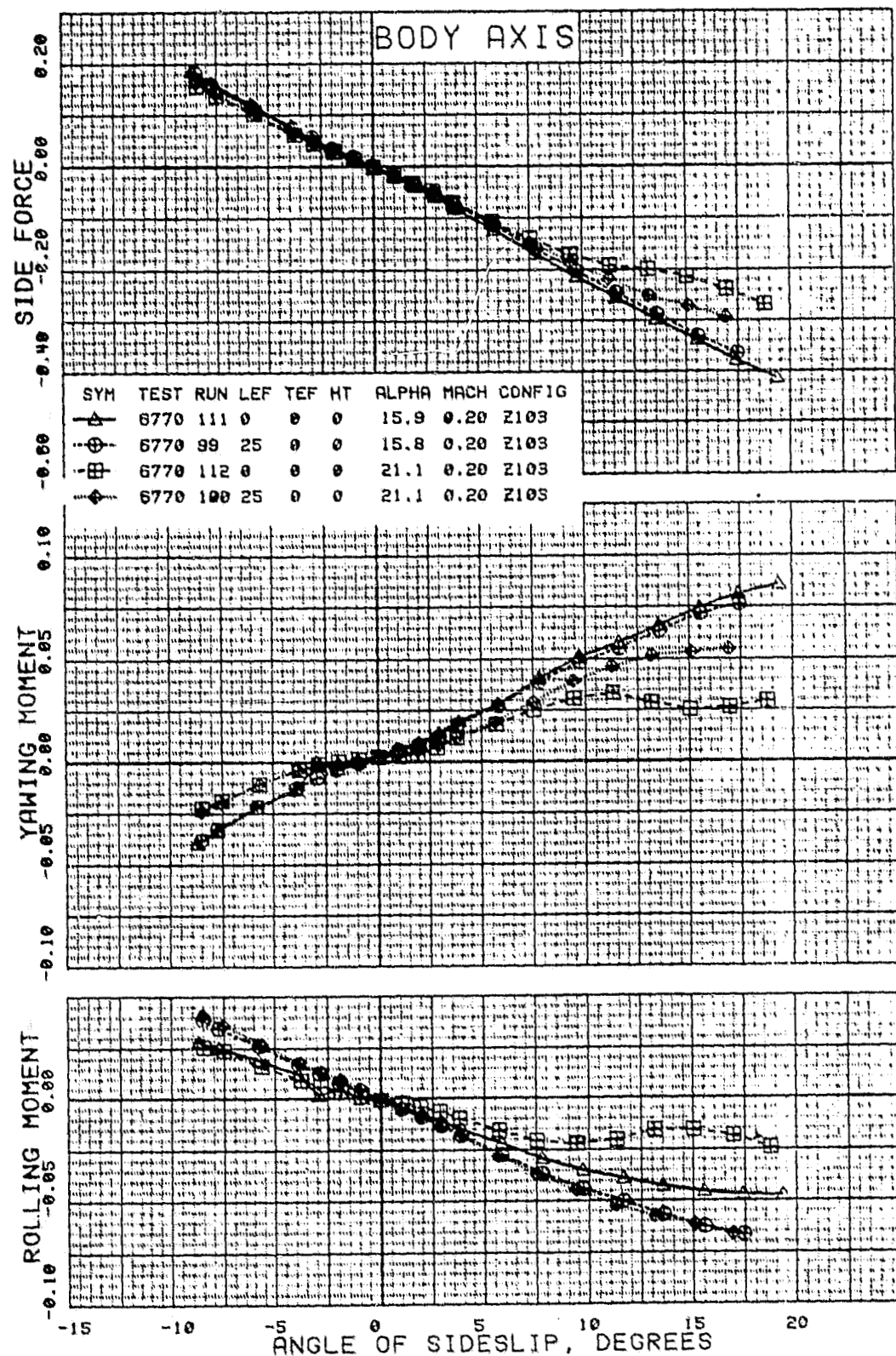


Figure 2-21 (b) Force and Moments, $\alpha=16$ and 21°

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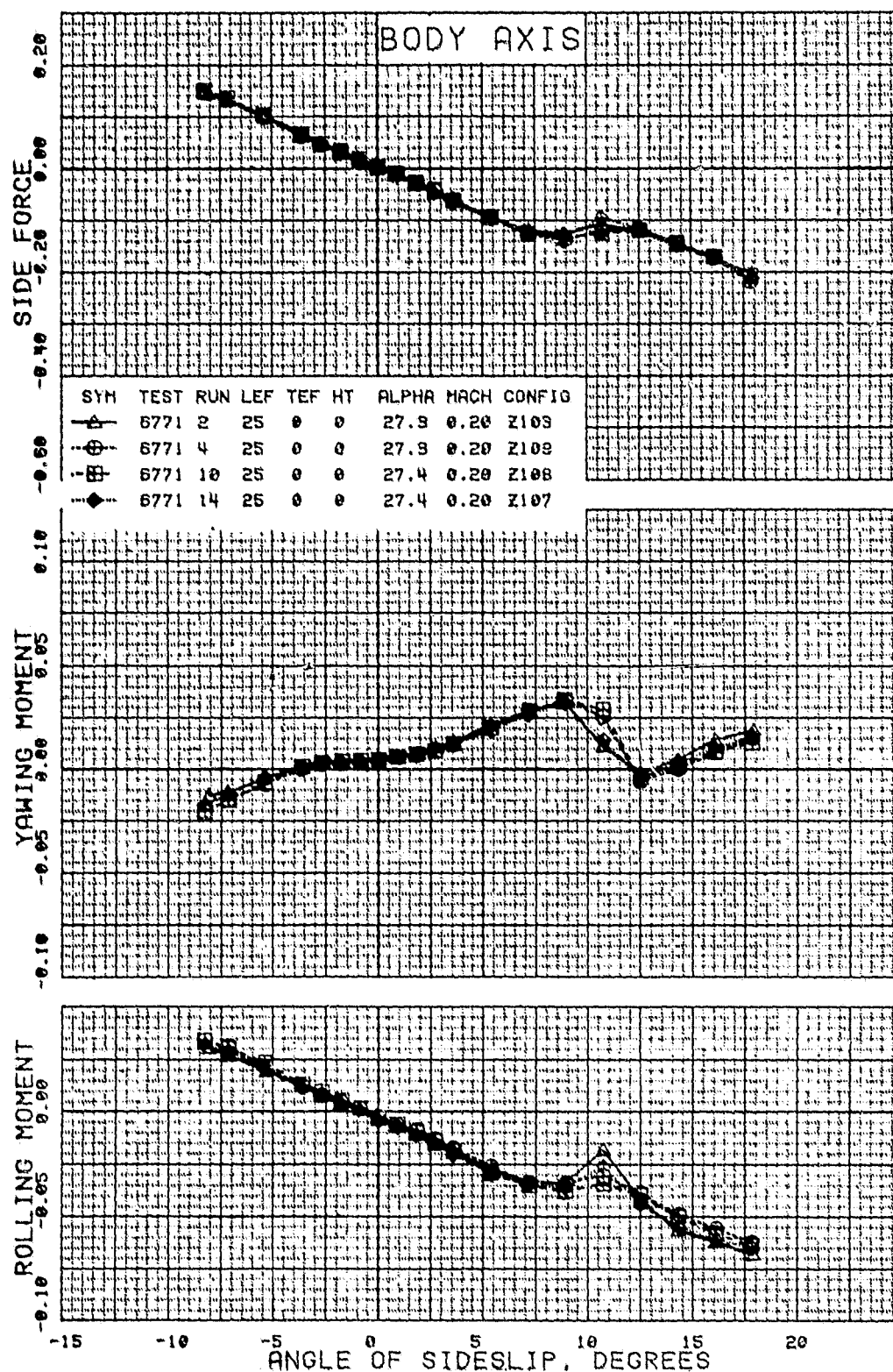


Figure 2-22 Effect of Forebody Strake Shape
(Z103,Z107-Z109), F-16 with Wing W24
(a) Force and Moments, $\alpha = 27^\circ$

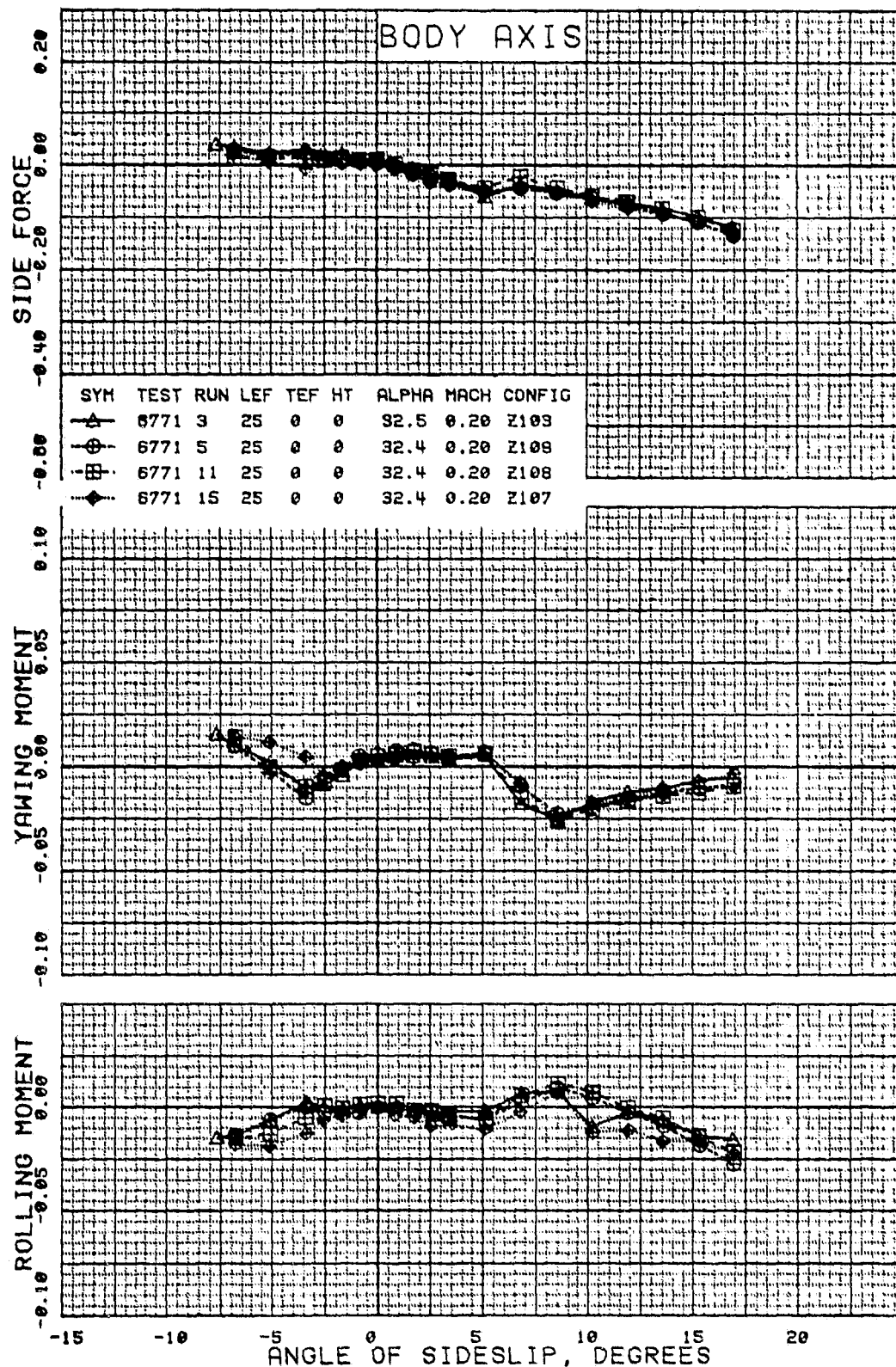


Figure 2-22 (b) Force and Moments, $\alpha = 32^\circ$

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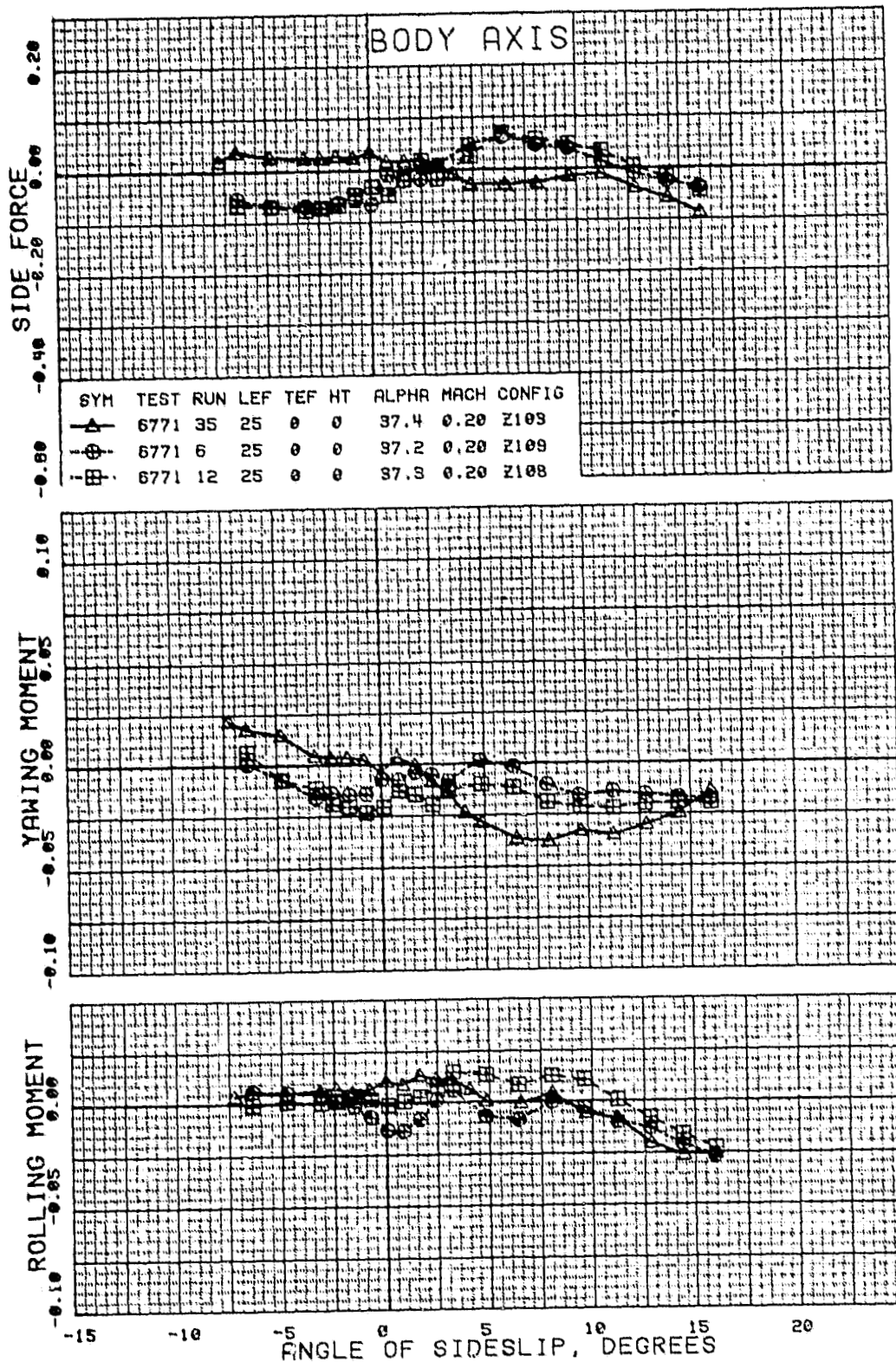


Figure 2-22 (c) Force and Moments, $\alpha = 37^\circ$

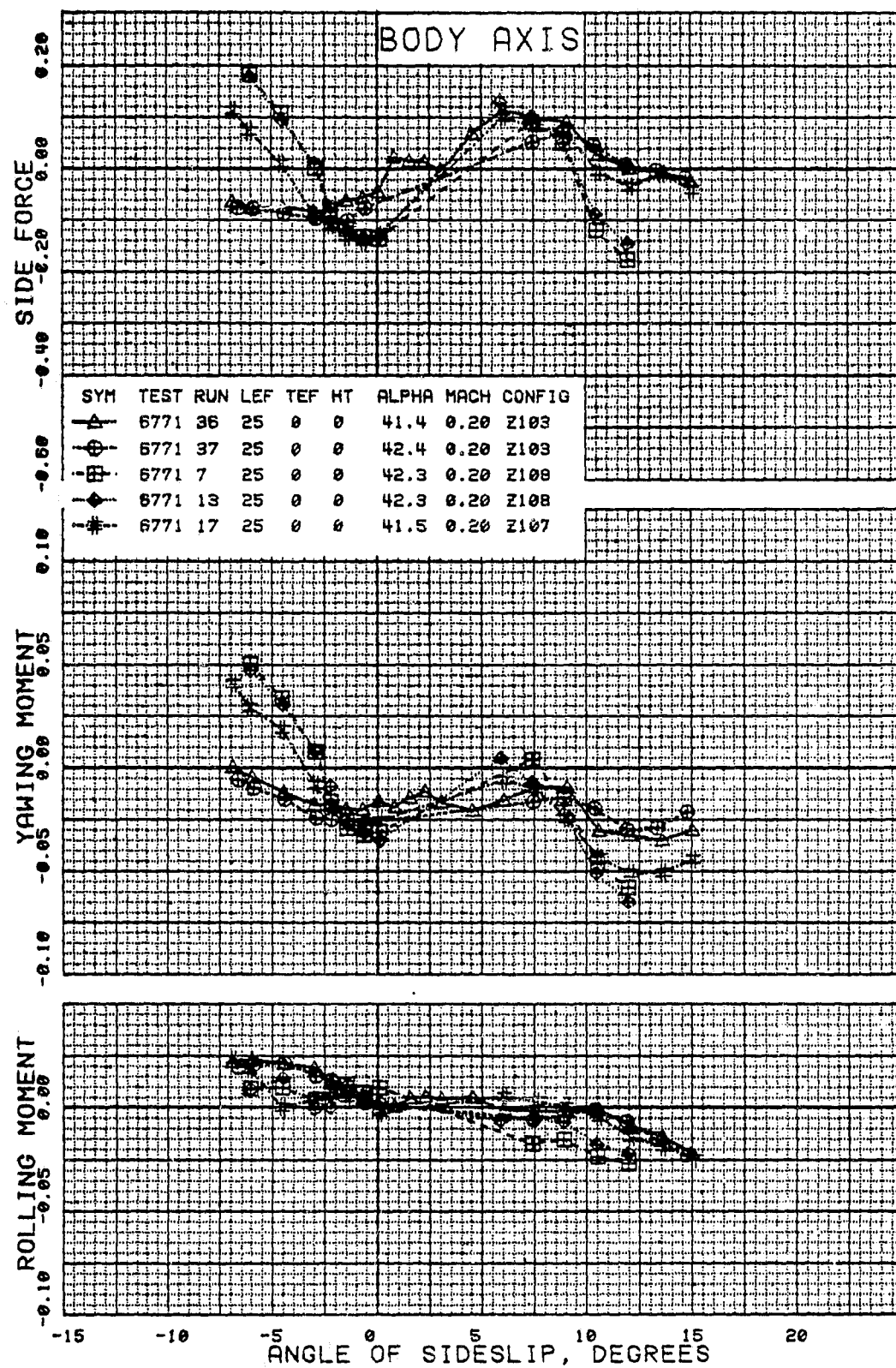


Figure 2-22 (d) Force and Moments, $\alpha=42^\circ$

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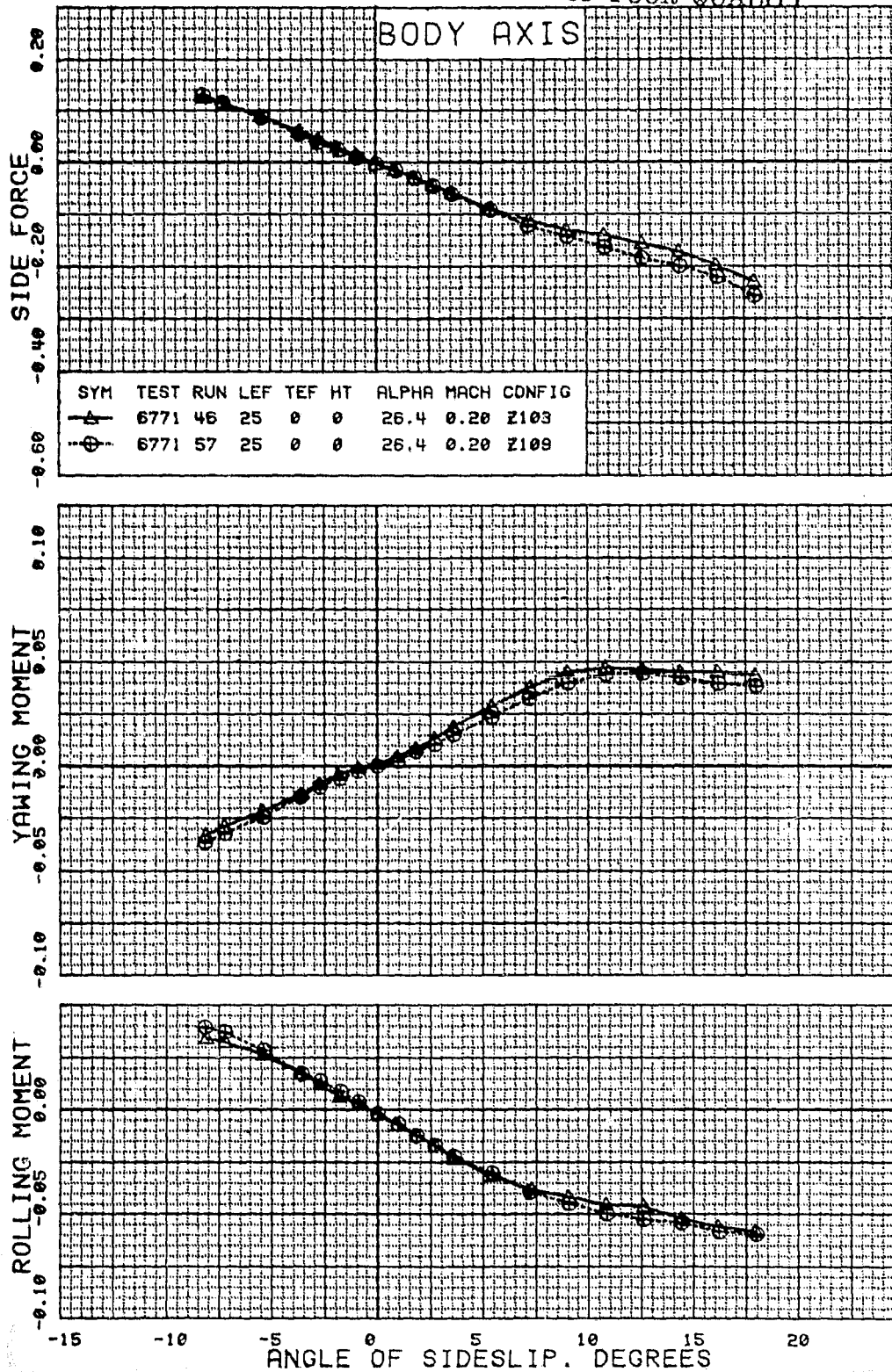


Figure 2-23 Effect of Forebody Strake (Z103 and Z109)
Forward Extent with Nose Strake Z112, F-16 with Wing W24
(a) Force and Moments, $\alpha = 26^\circ$

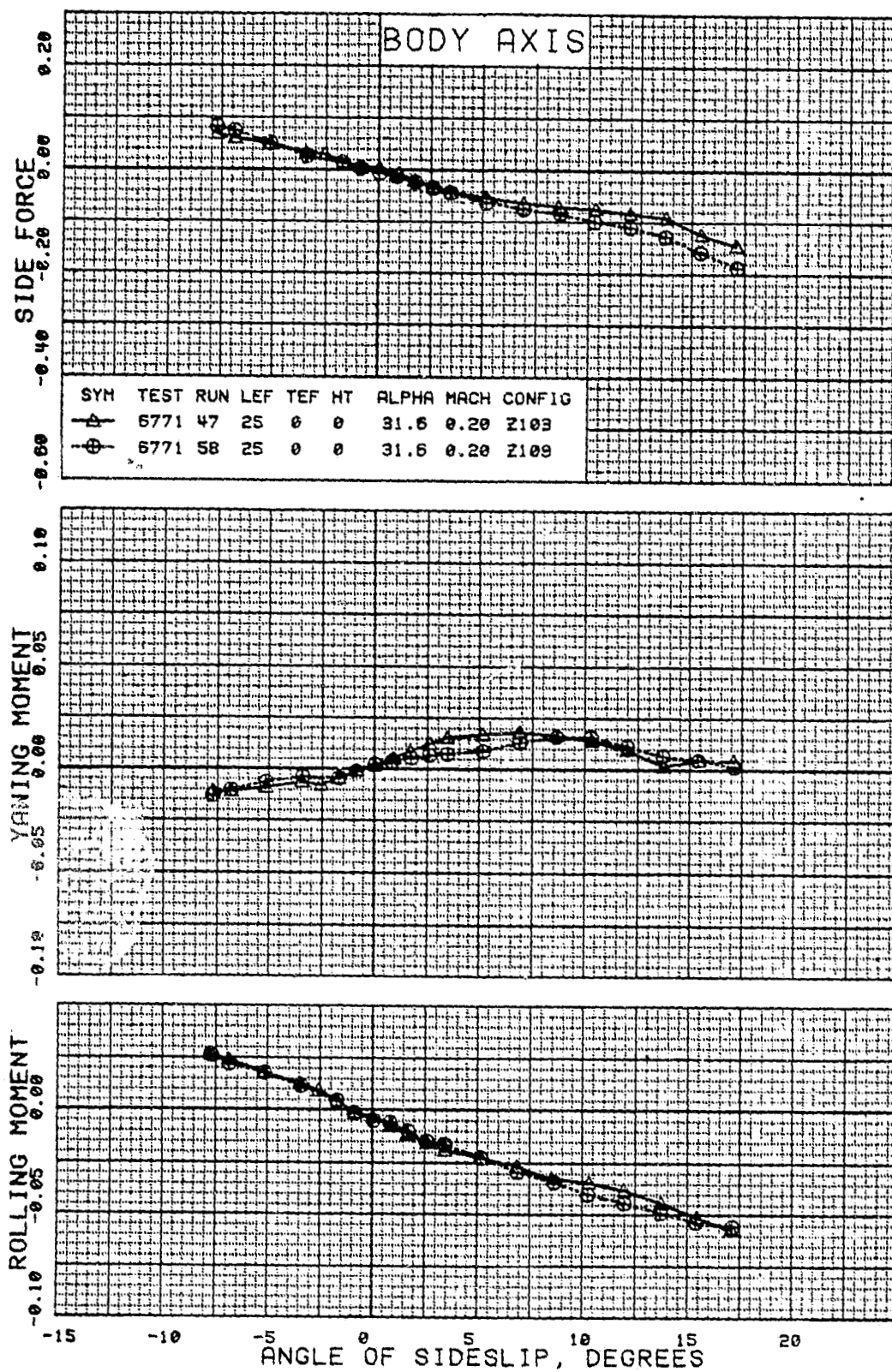


Figure 2-23 (b) Force and Moments, $\alpha = 32^\circ$

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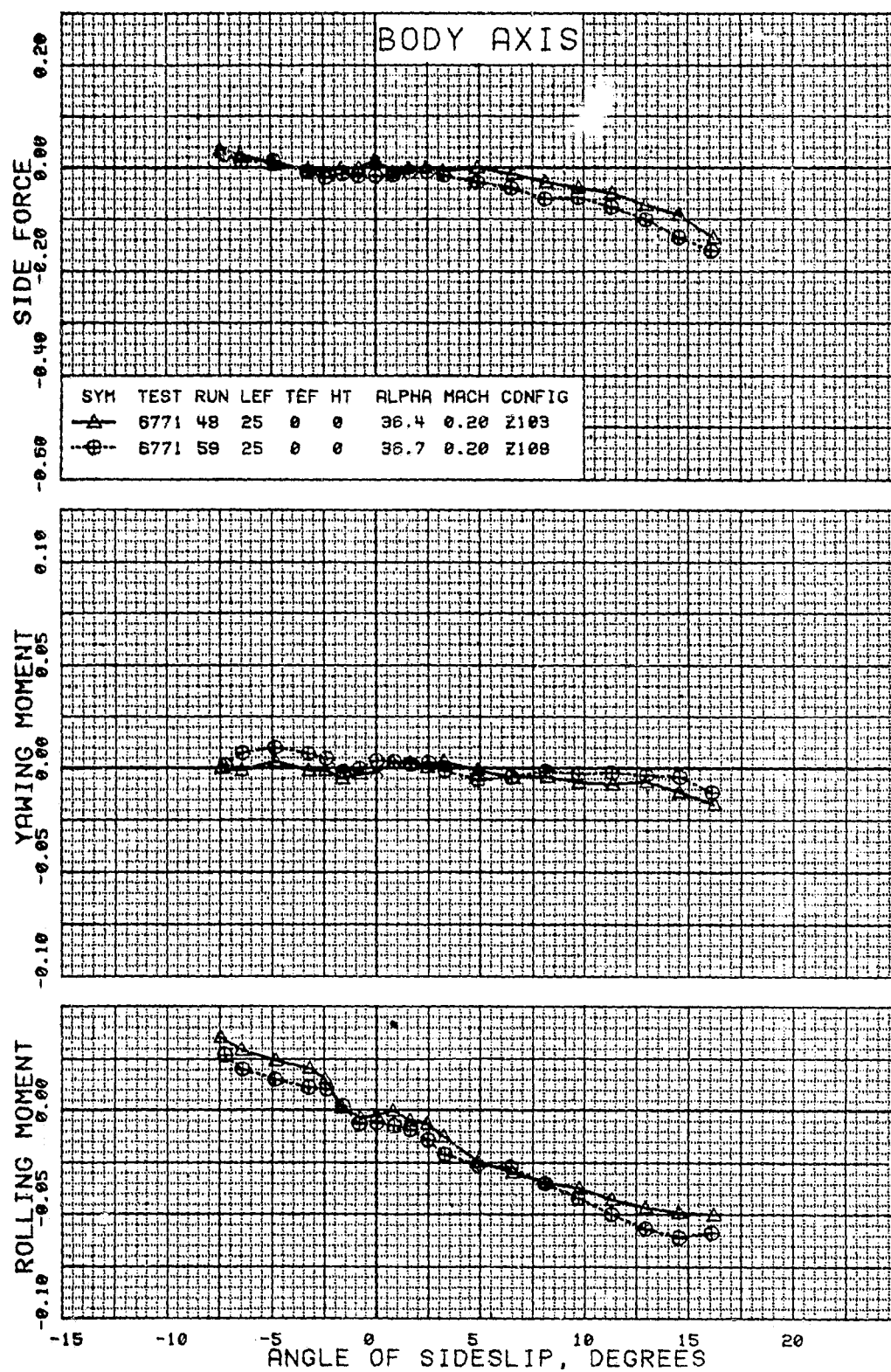


Figure 2-23 (c) Force and Moments, $\alpha = 36^\circ$

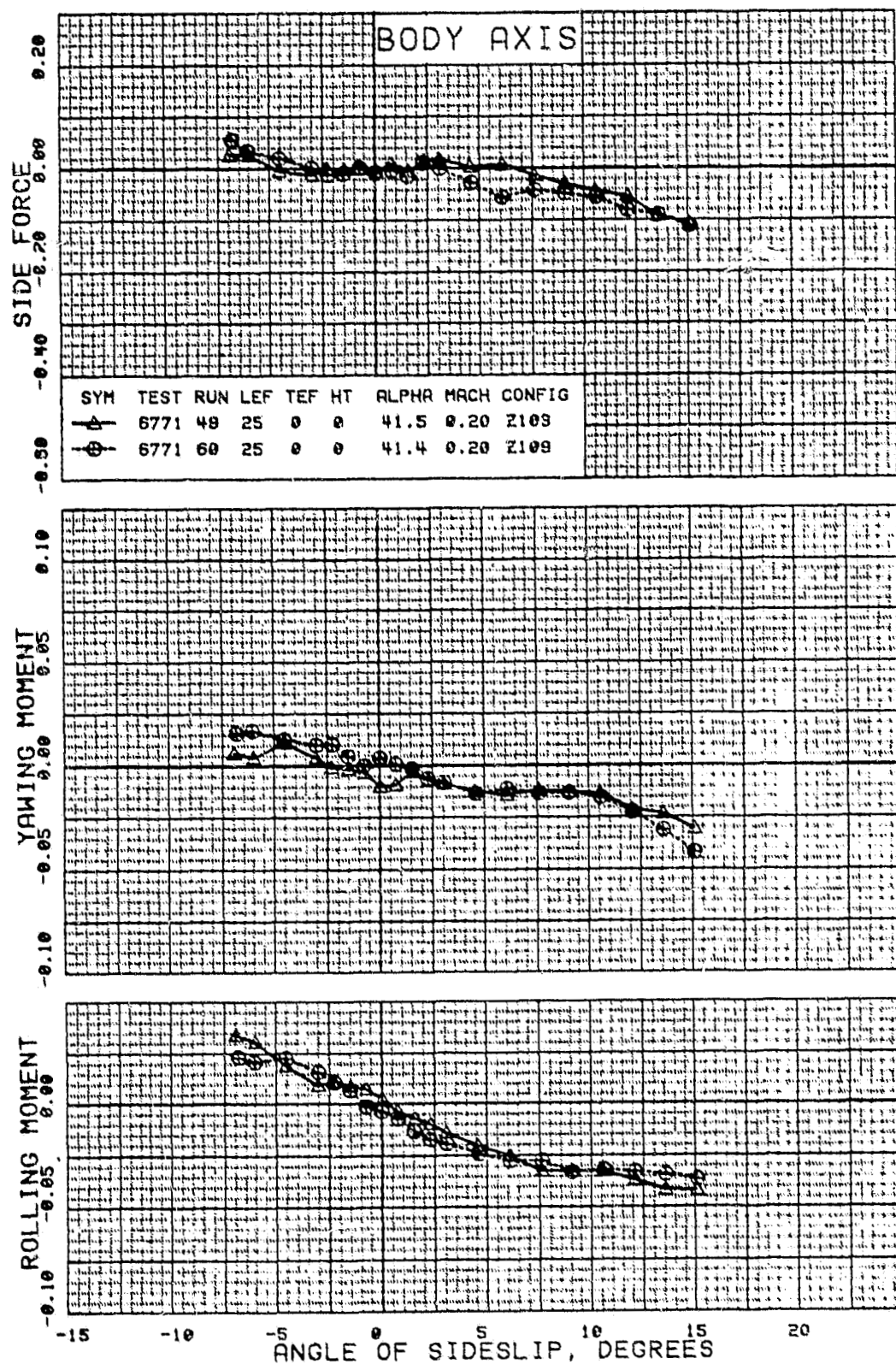


Figure 2-23 (d) Force and Moments, $\alpha=41^\circ$

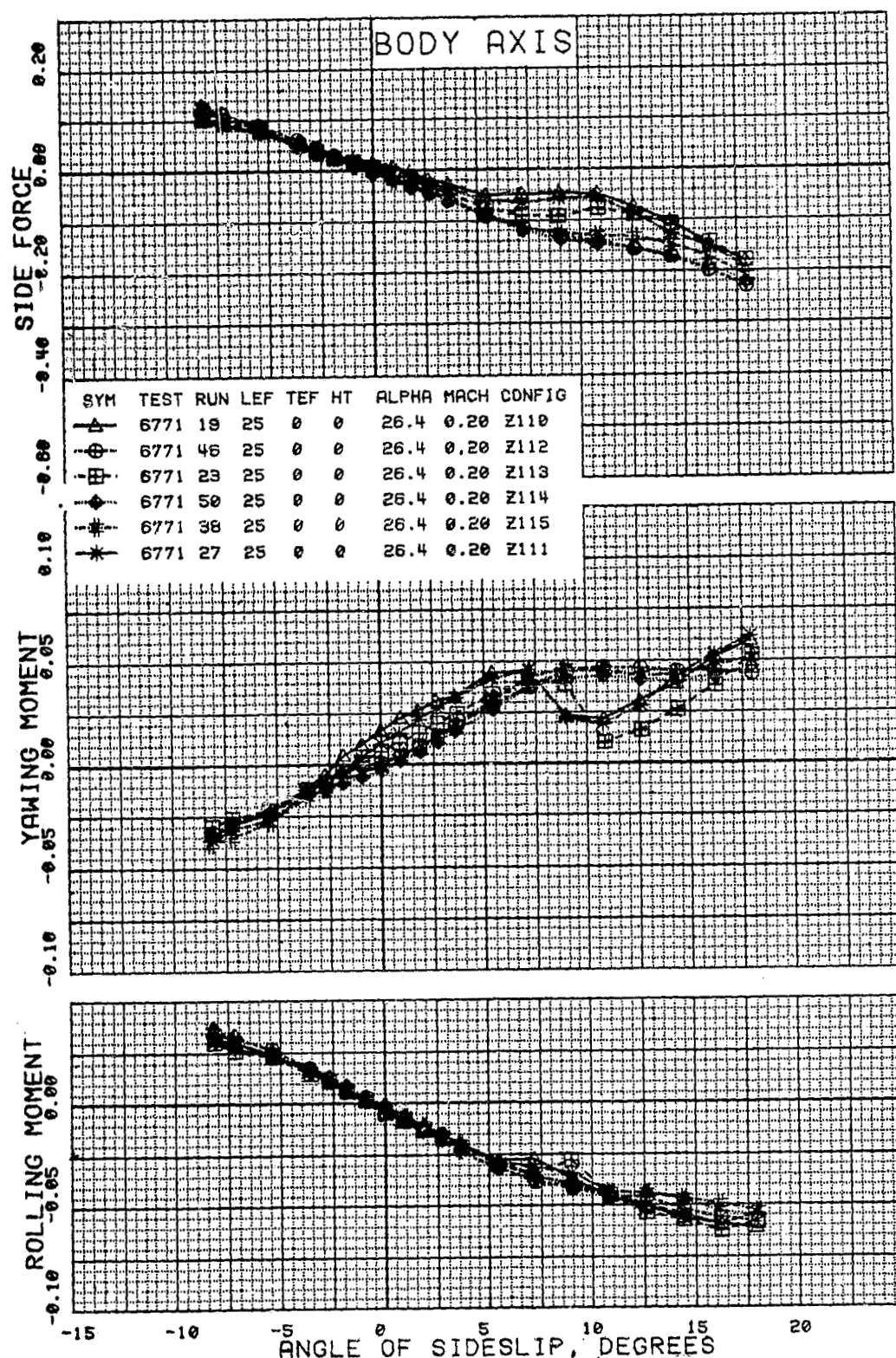


Figure 2-24 Effect of Nose Strakes Z110-Z115, F-16
with Wing W24
(a) Force and Moments, $\alpha=26^\circ$

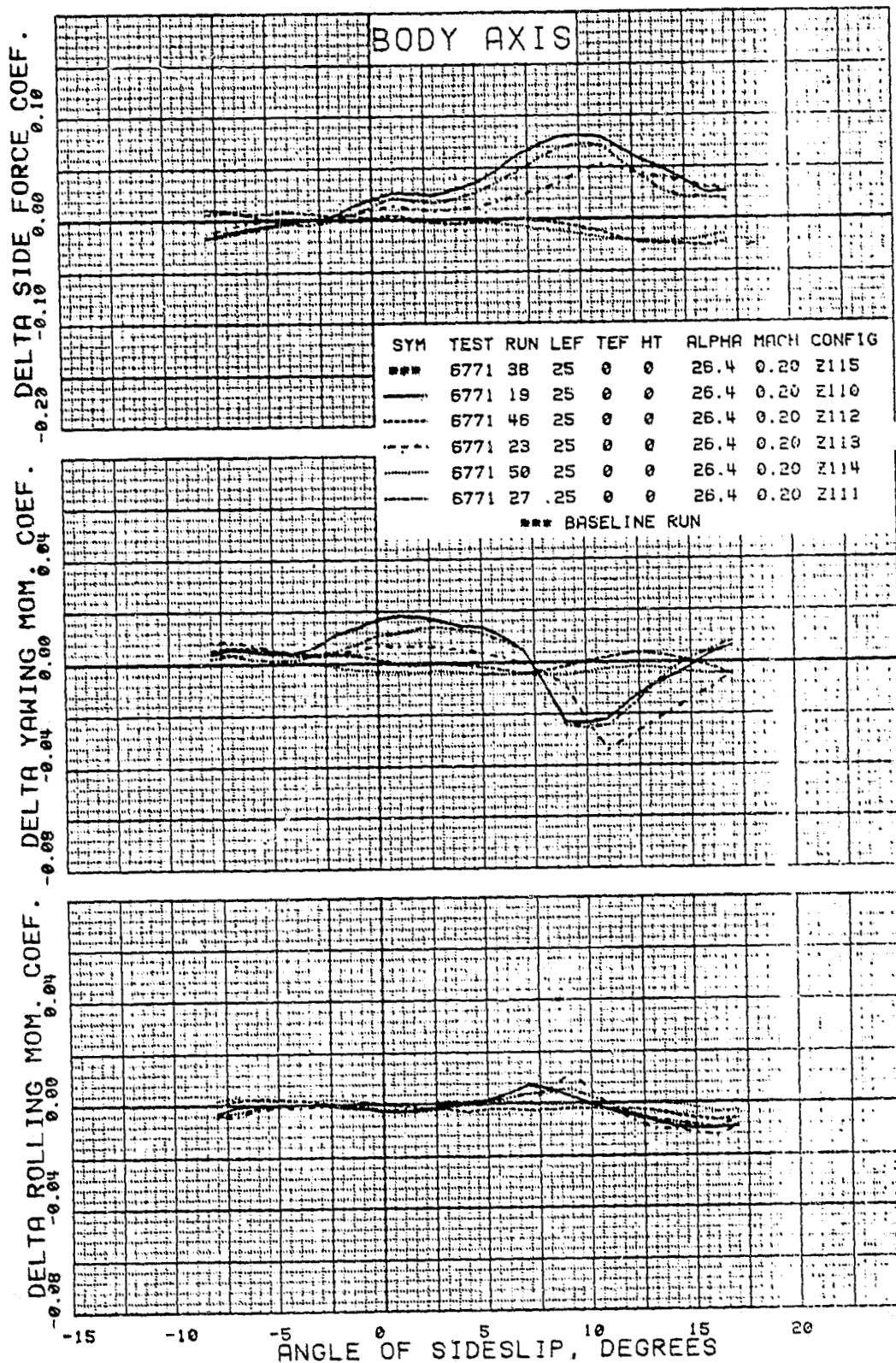


Figure 2-24 (b) Increments, $\alpha=26^\circ$

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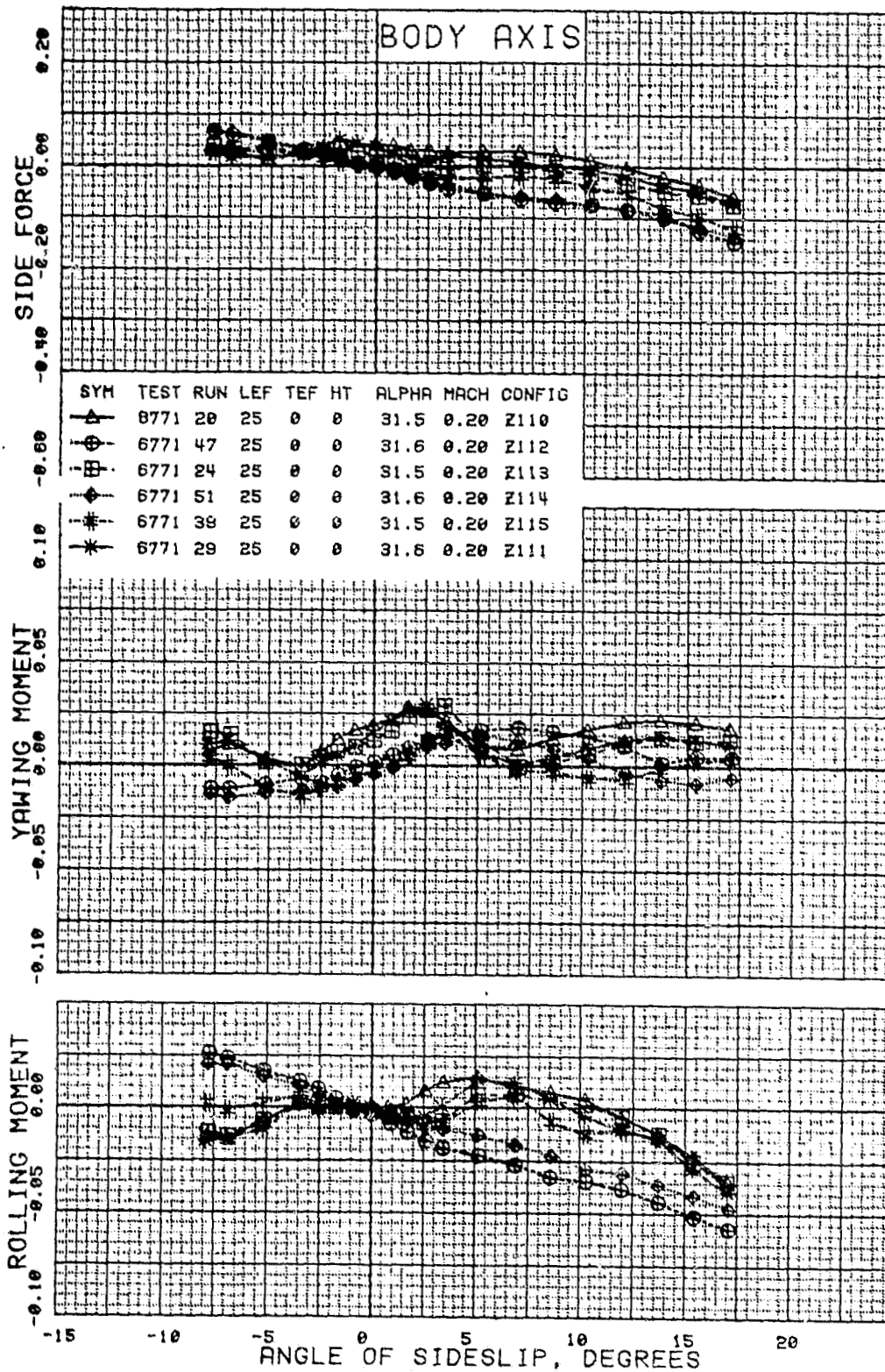


Figure 2-24 (c) Force and Moments, $\alpha = 32^\circ$

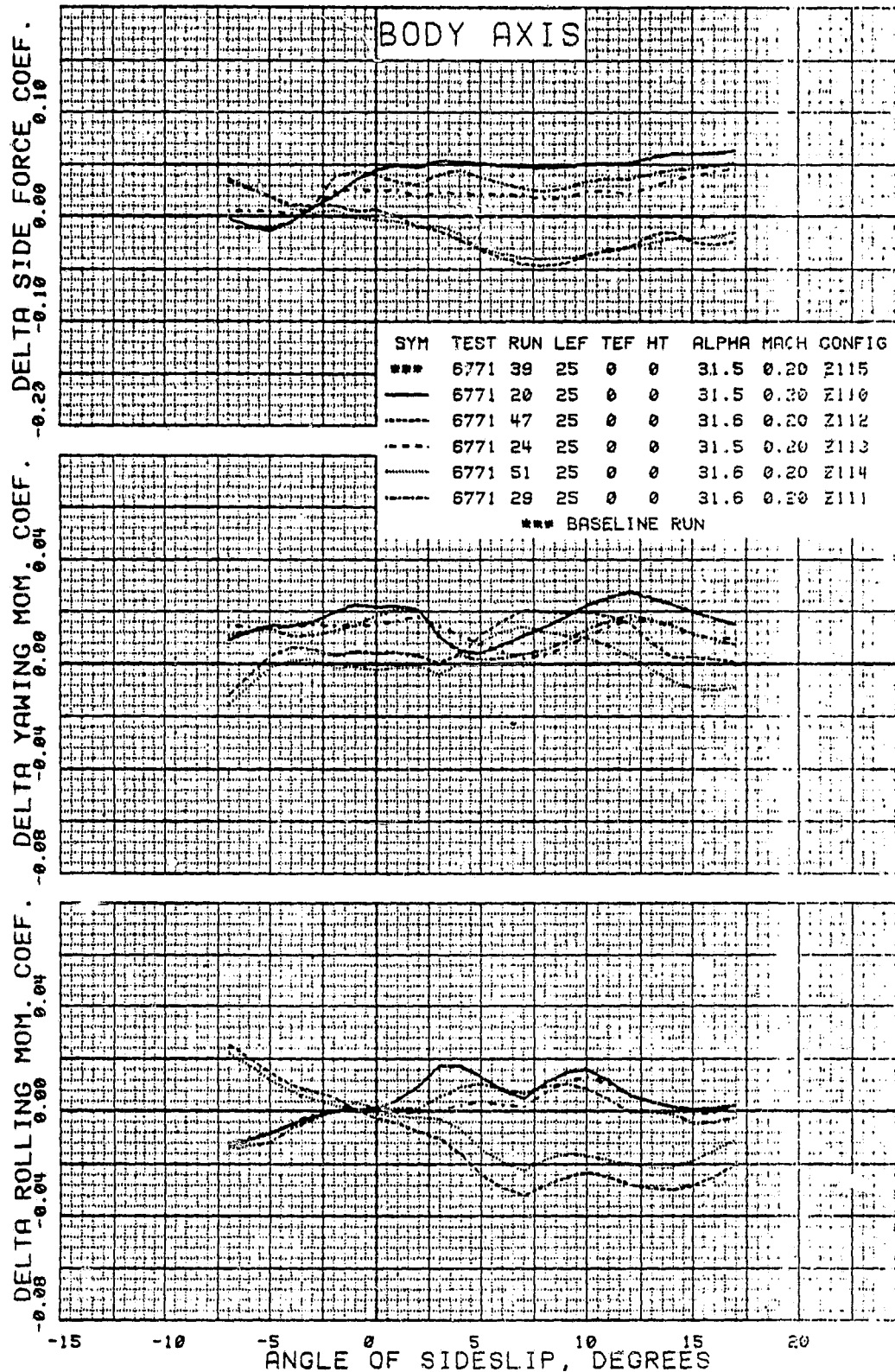


Figure 2-24 (d) Increments, $\alpha = 32^\circ$

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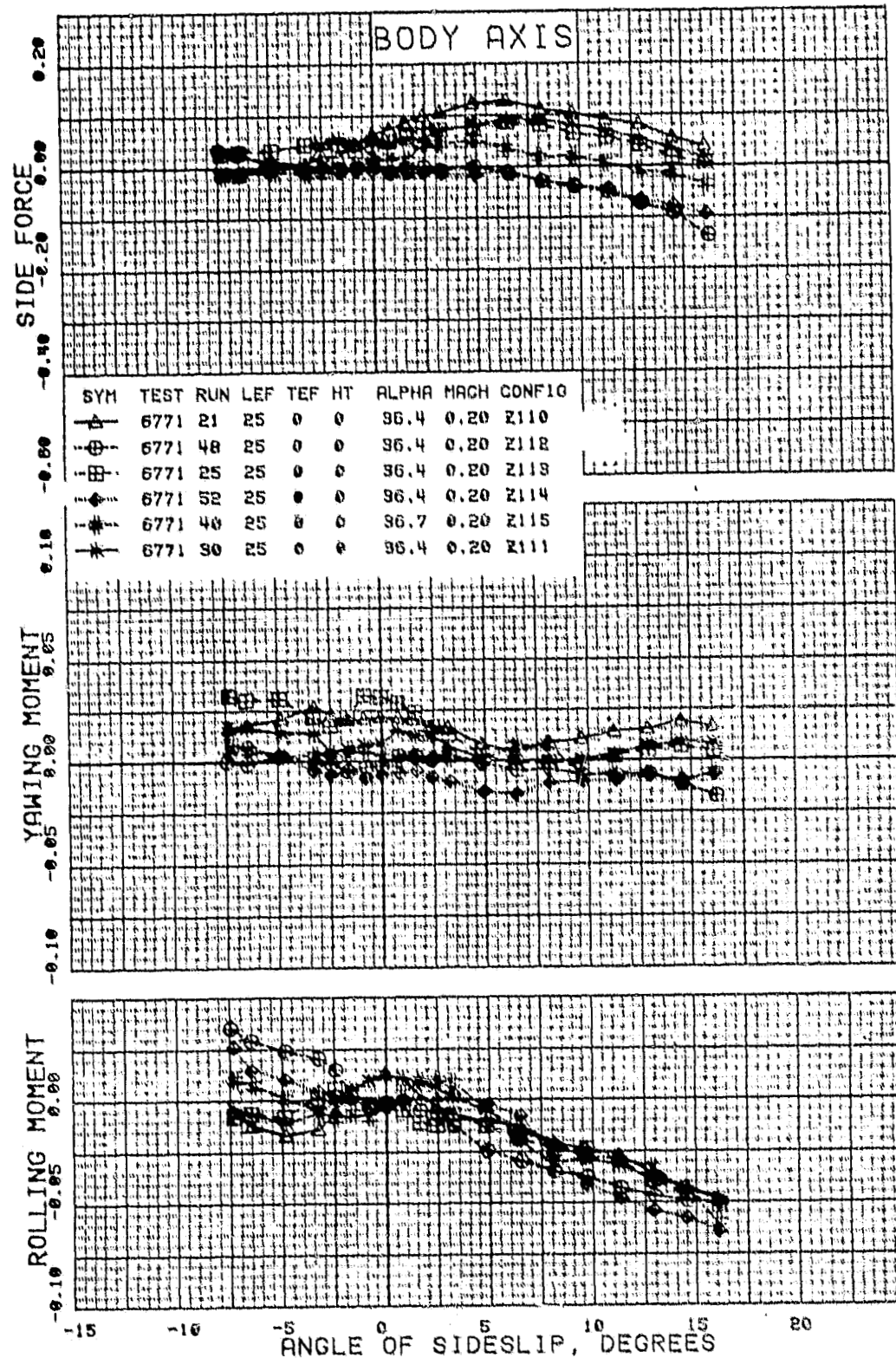
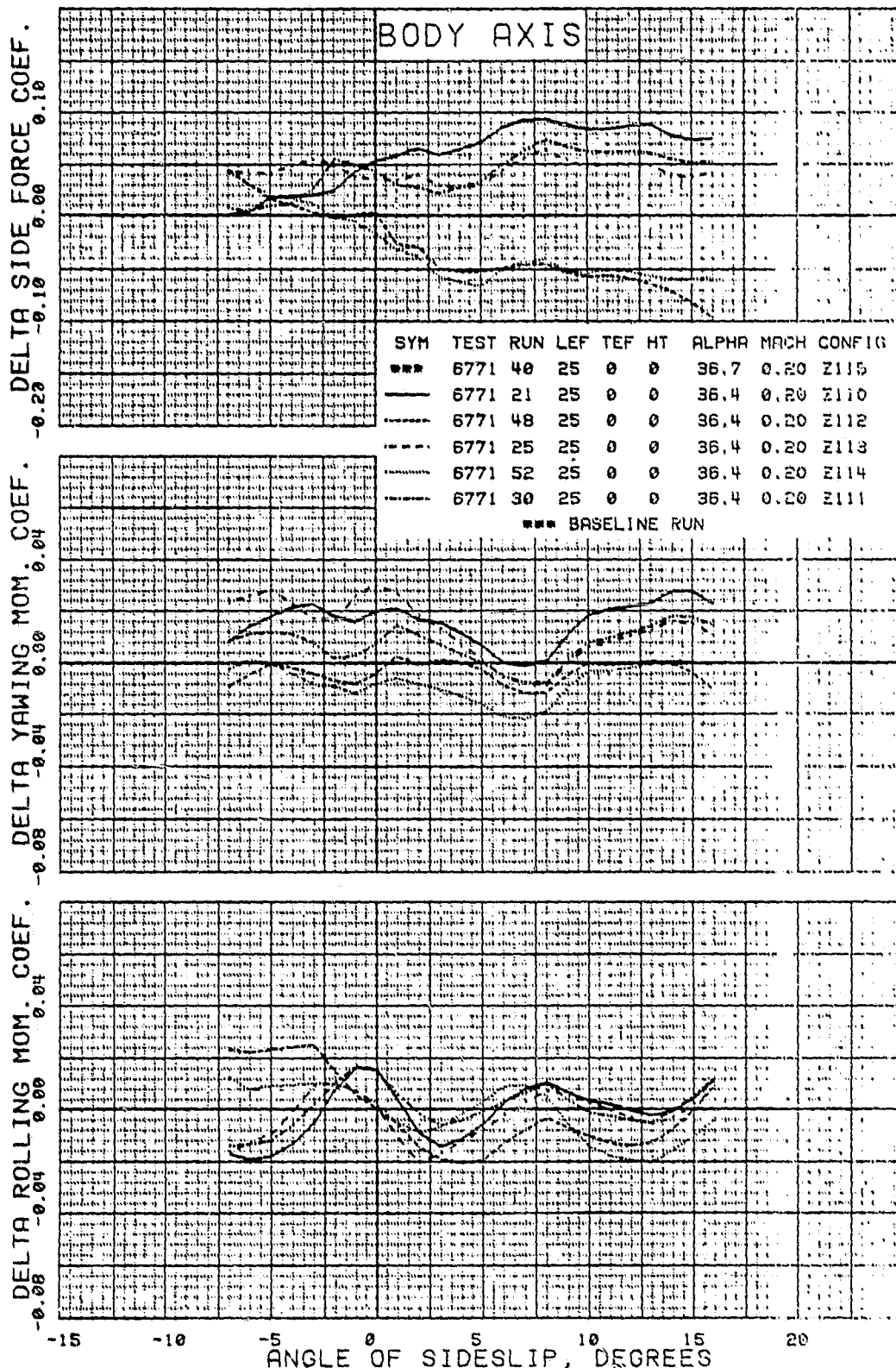


Figure 2-24 (e) Force and Moments, $\alpha = 36^\circ$



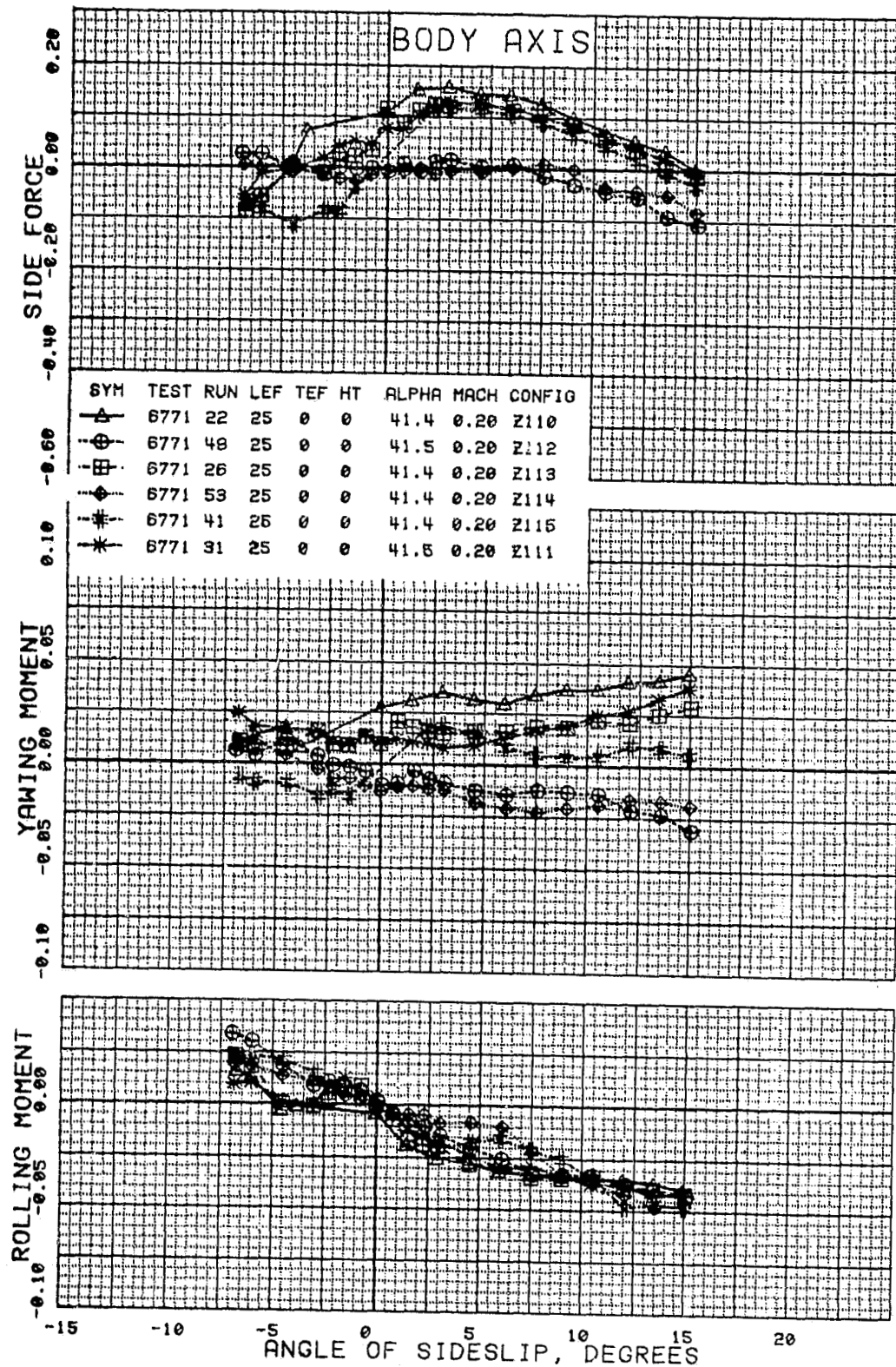


Figure 2-24 (g) Force and Moments, $\alpha = 41^\circ$

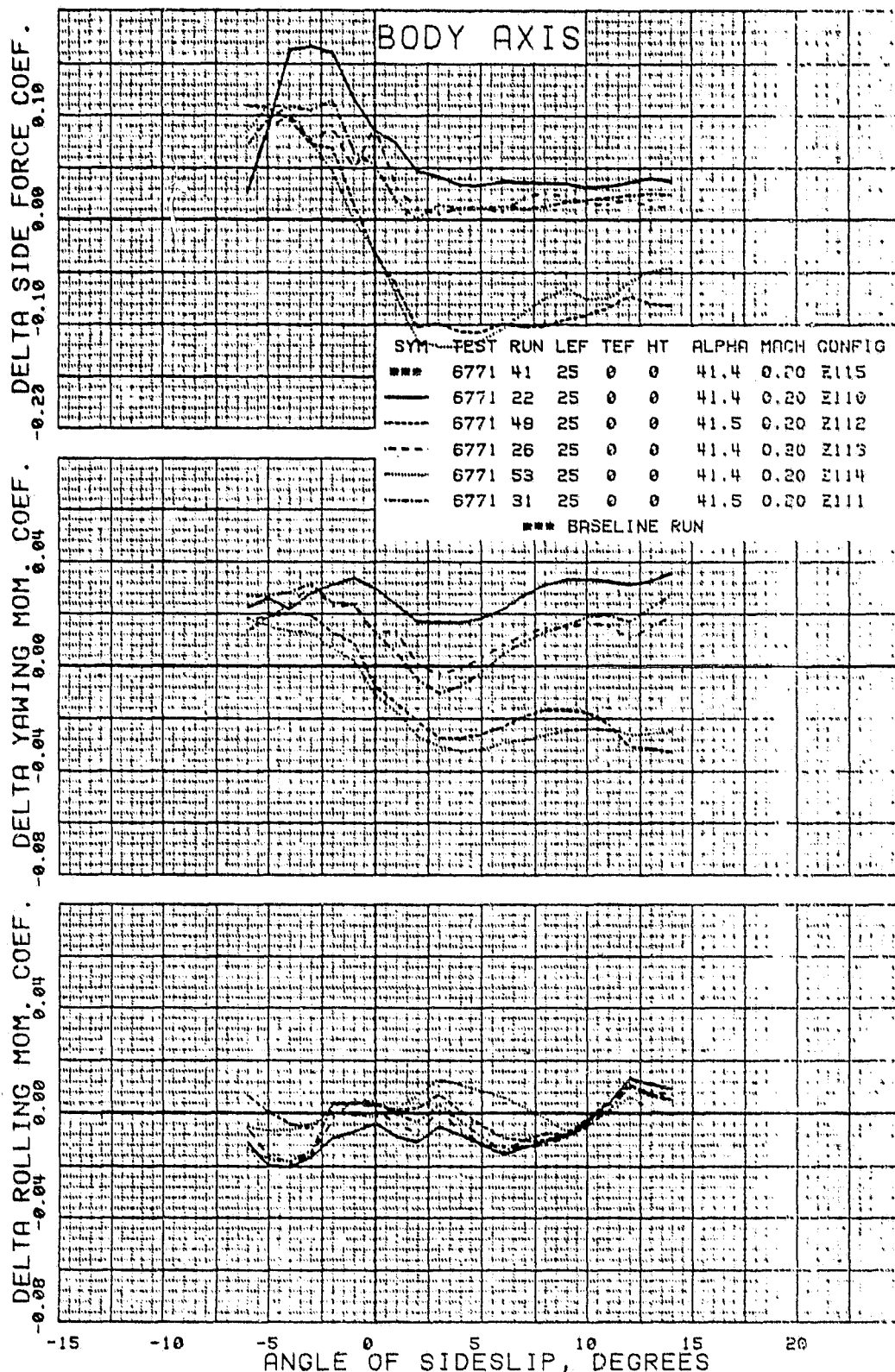


Figure 2-24 (h) Increments, $\alpha = 41^\circ$

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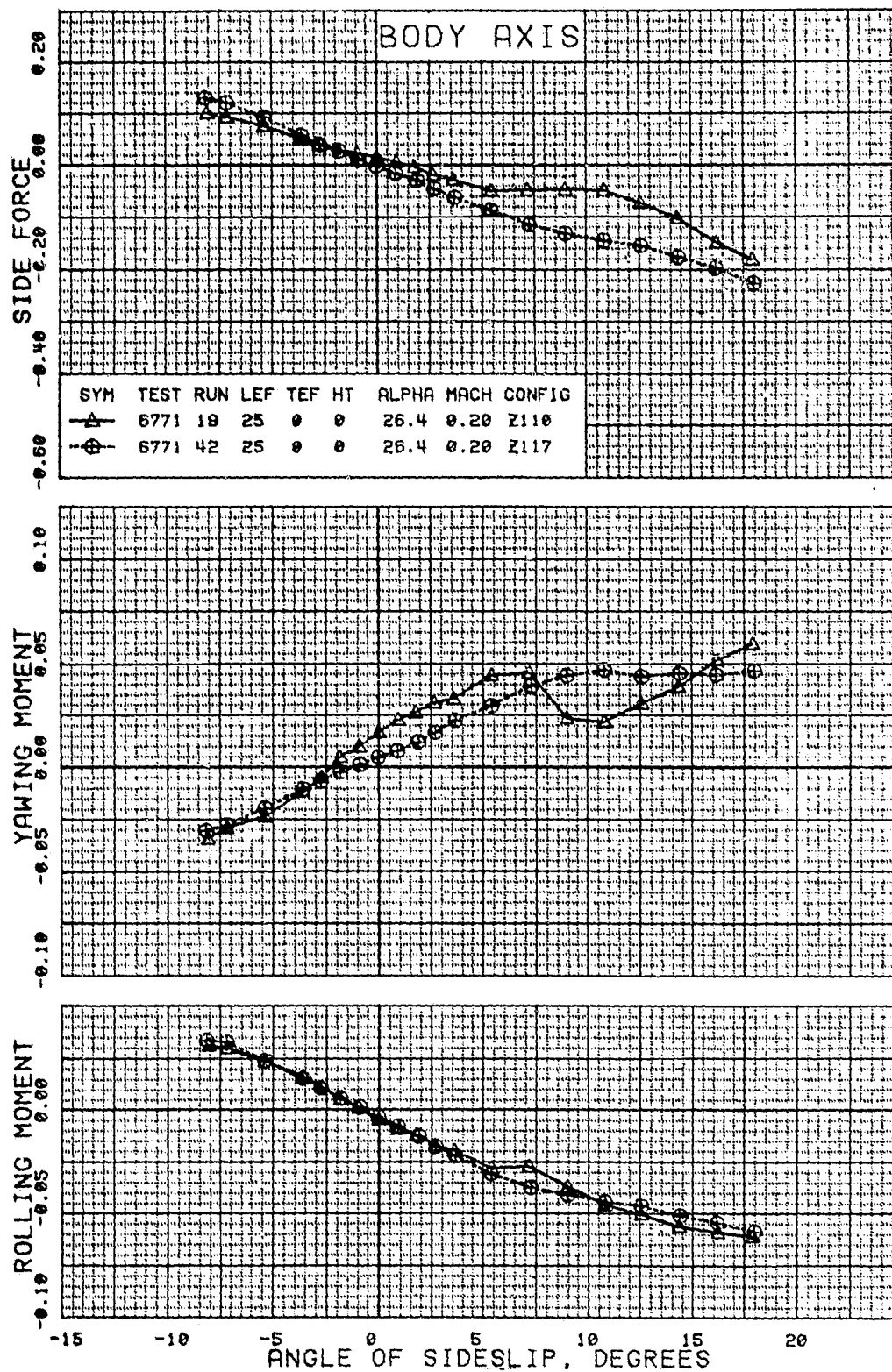


Figure 2-25 Effect of Nose Strakes Z110 and Z117,
F-16 with Wing W24
(a) Force and Moments, $\alpha = 26^\circ$

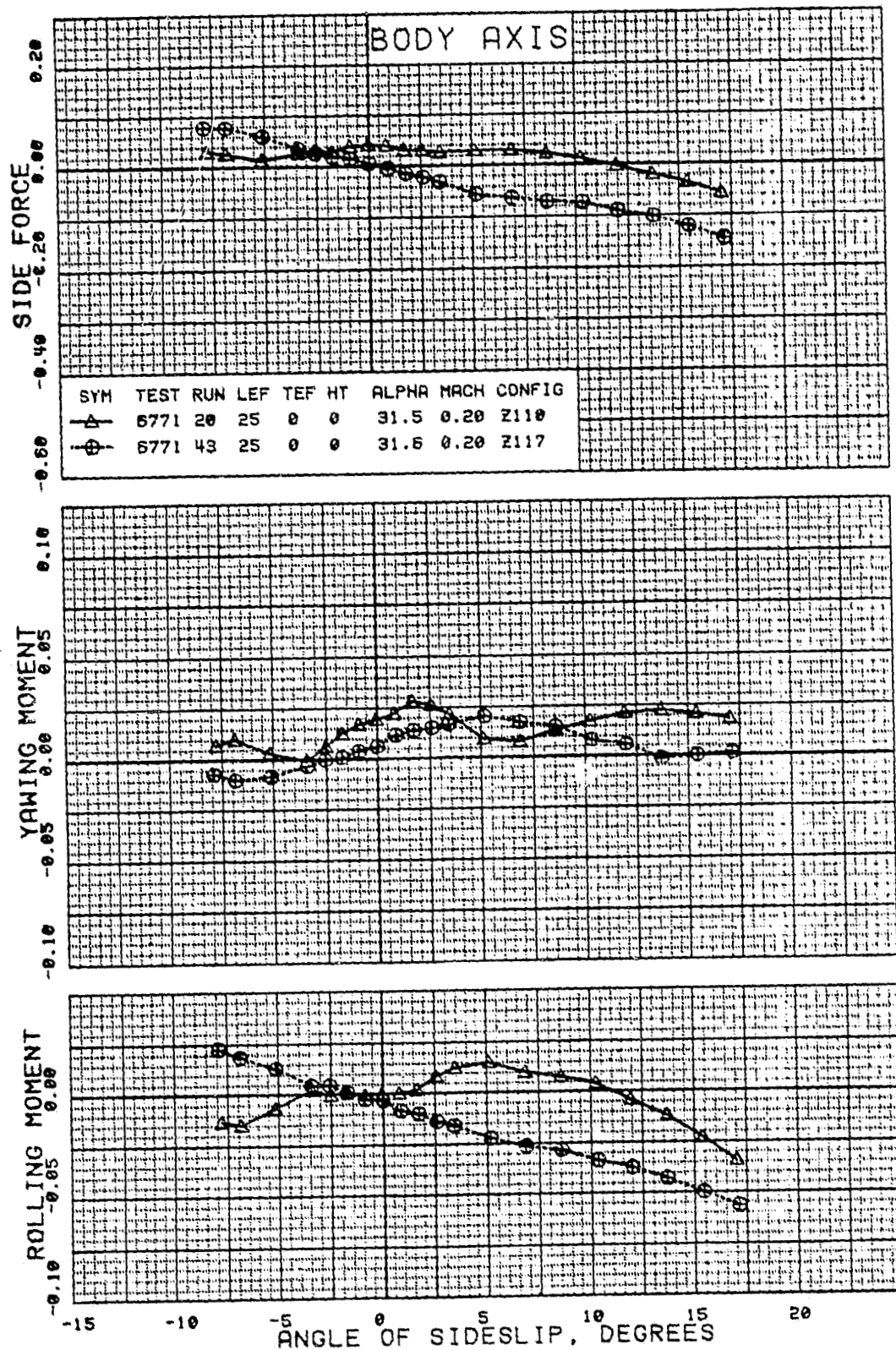


Figure 2-25 (b) Force and Moments, $\alpha = 32^\circ$

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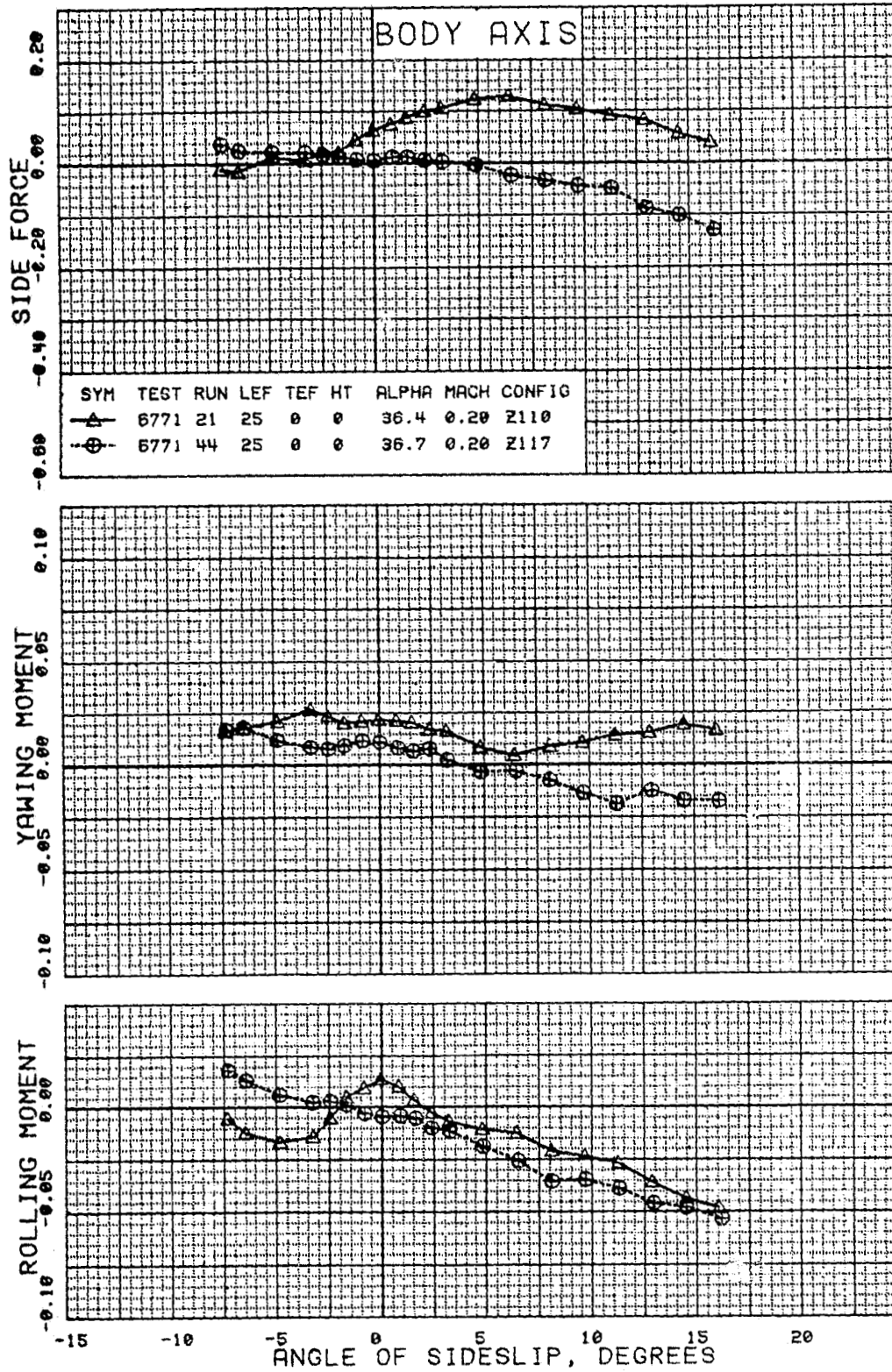


Figure 2-25 (c) Force and Moments, $\alpha = 36^\circ$

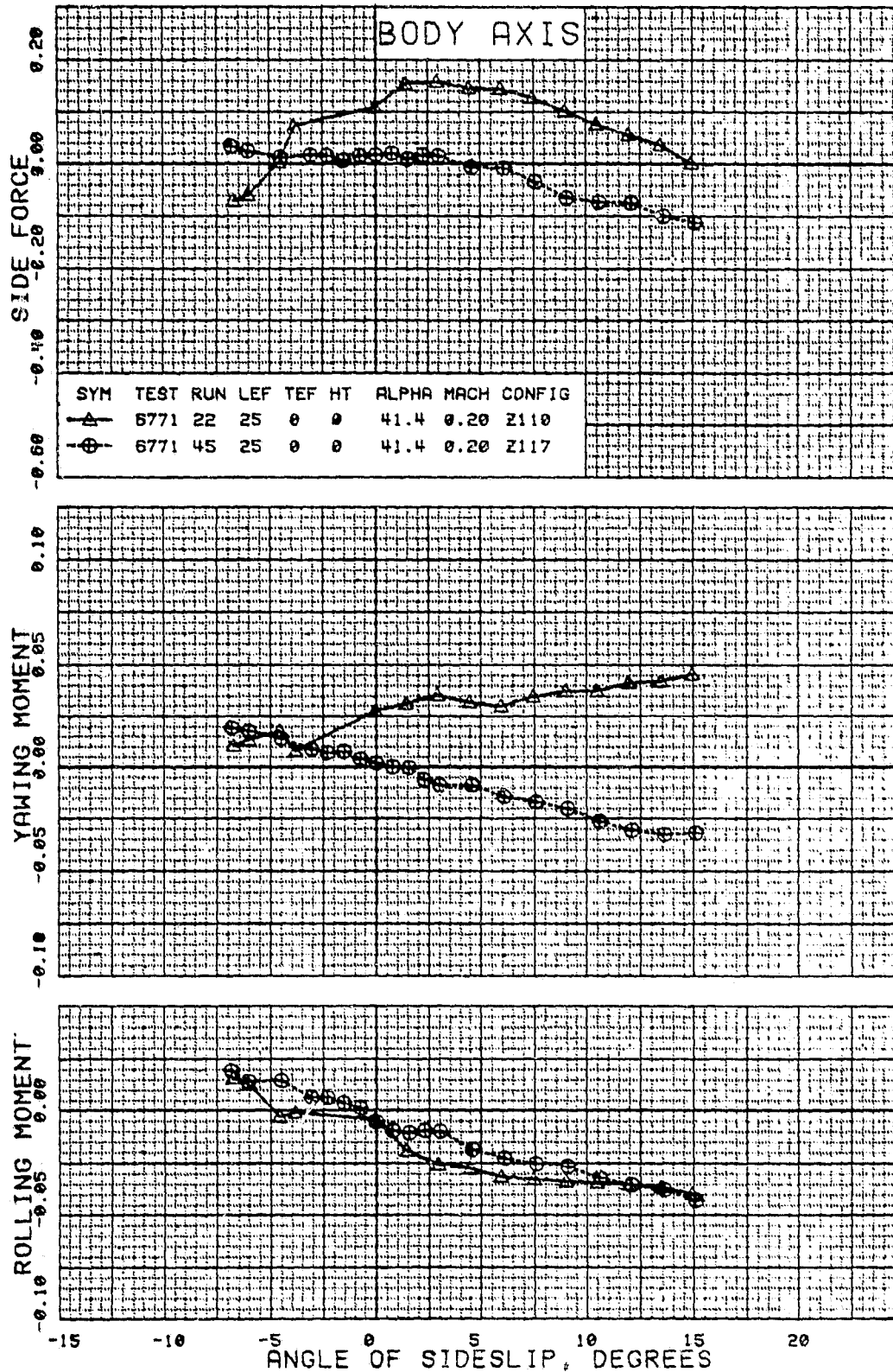


Figure 2-25 (d) Force and Moments, $\alpha = 41^\circ$

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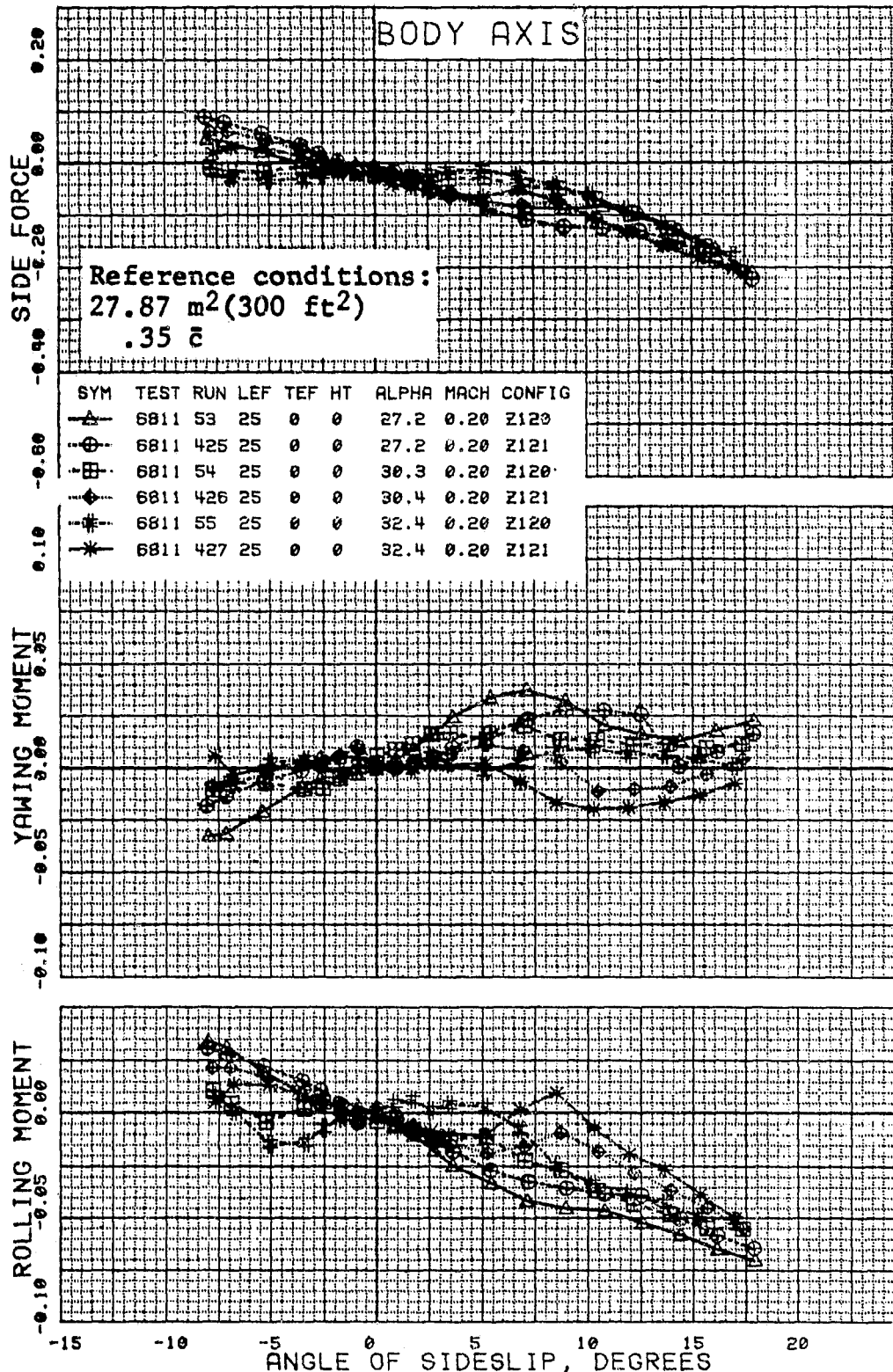


Figure 2-26 Effect of Forebody Strakes Z120 and Z121 with
Canard Strake Z79, F-16

(a) Force and Moments, $\alpha = 27, 30$ and 32°

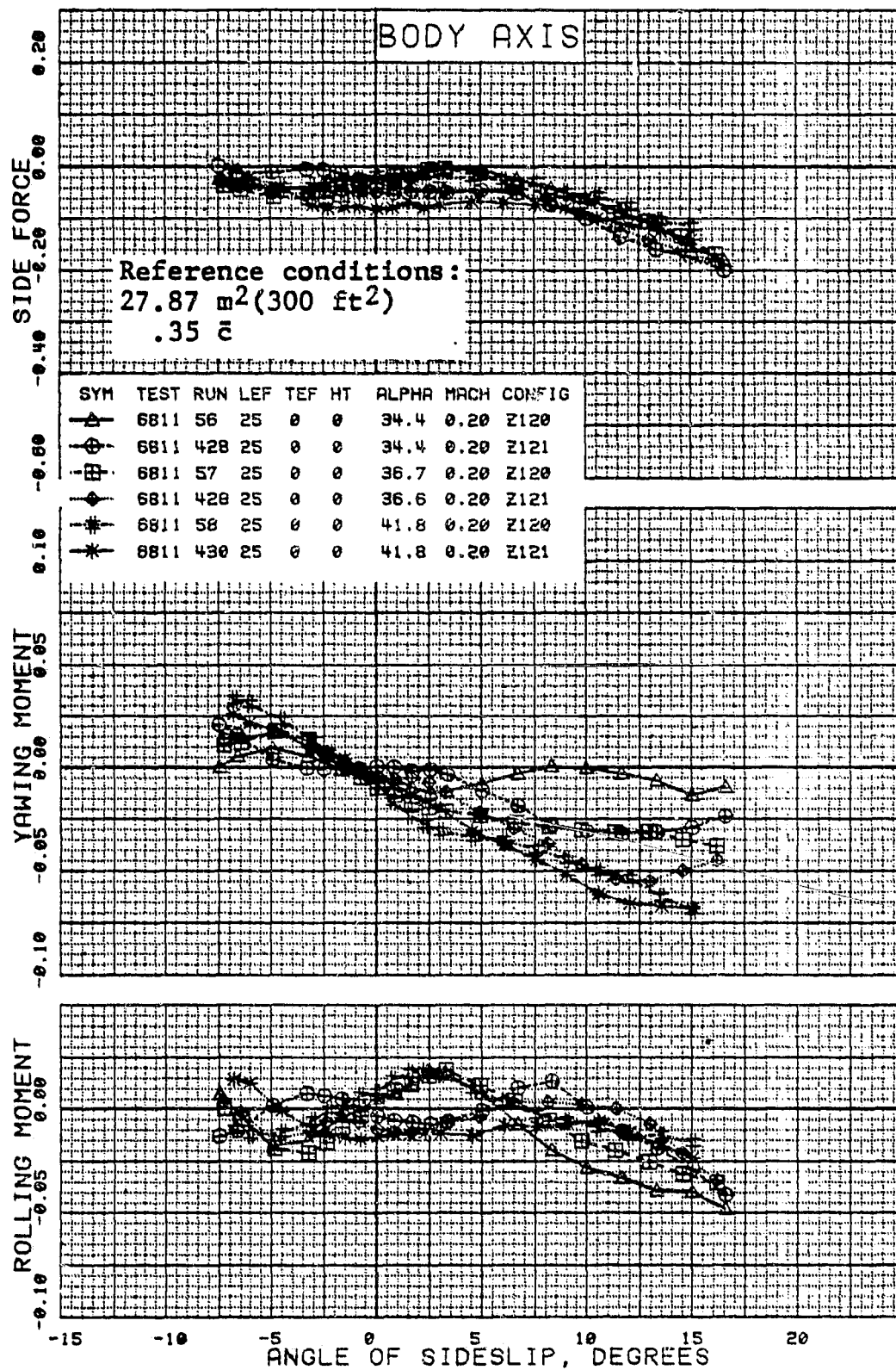


Figure 2-26 (b) Force and Moments, $\alpha = 34, 37$ and 42°

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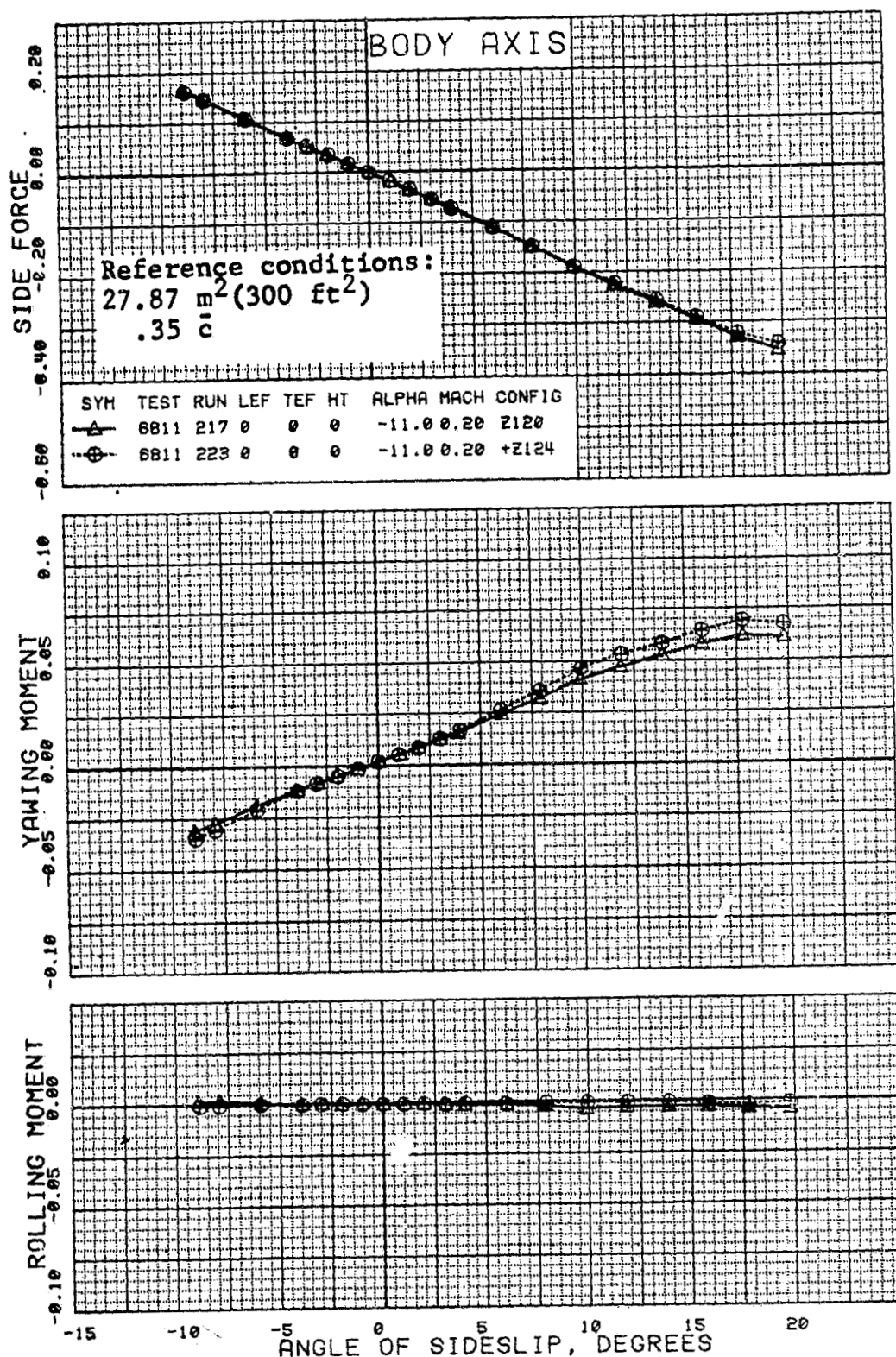


Figure 2-27 Effect of Nose Strake Z124, F-16
 (a) Force and Moments, $\alpha = -11^\circ$

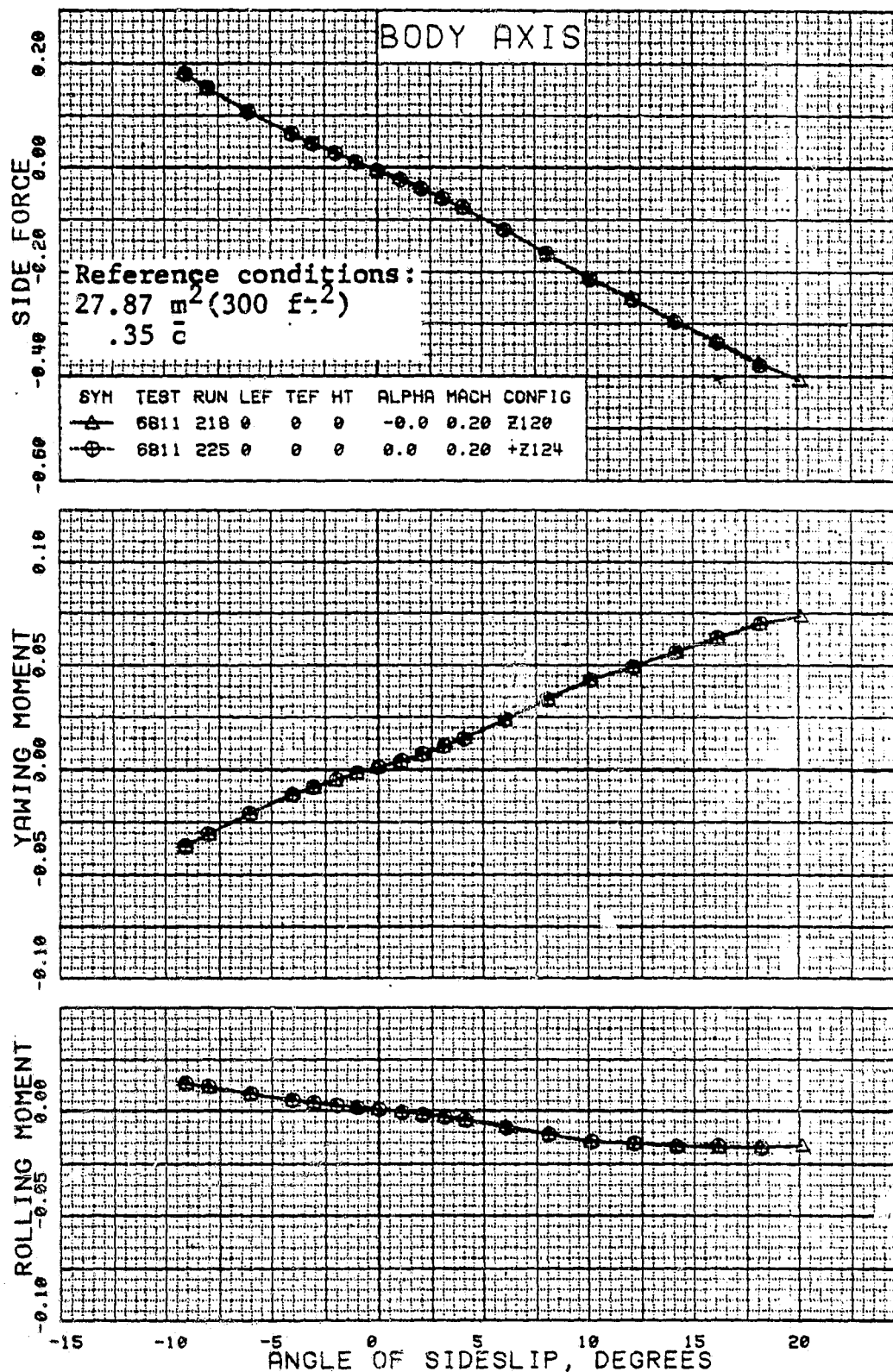


Figure 2-27 (b) Force and Moments, $\alpha = 0^\circ$

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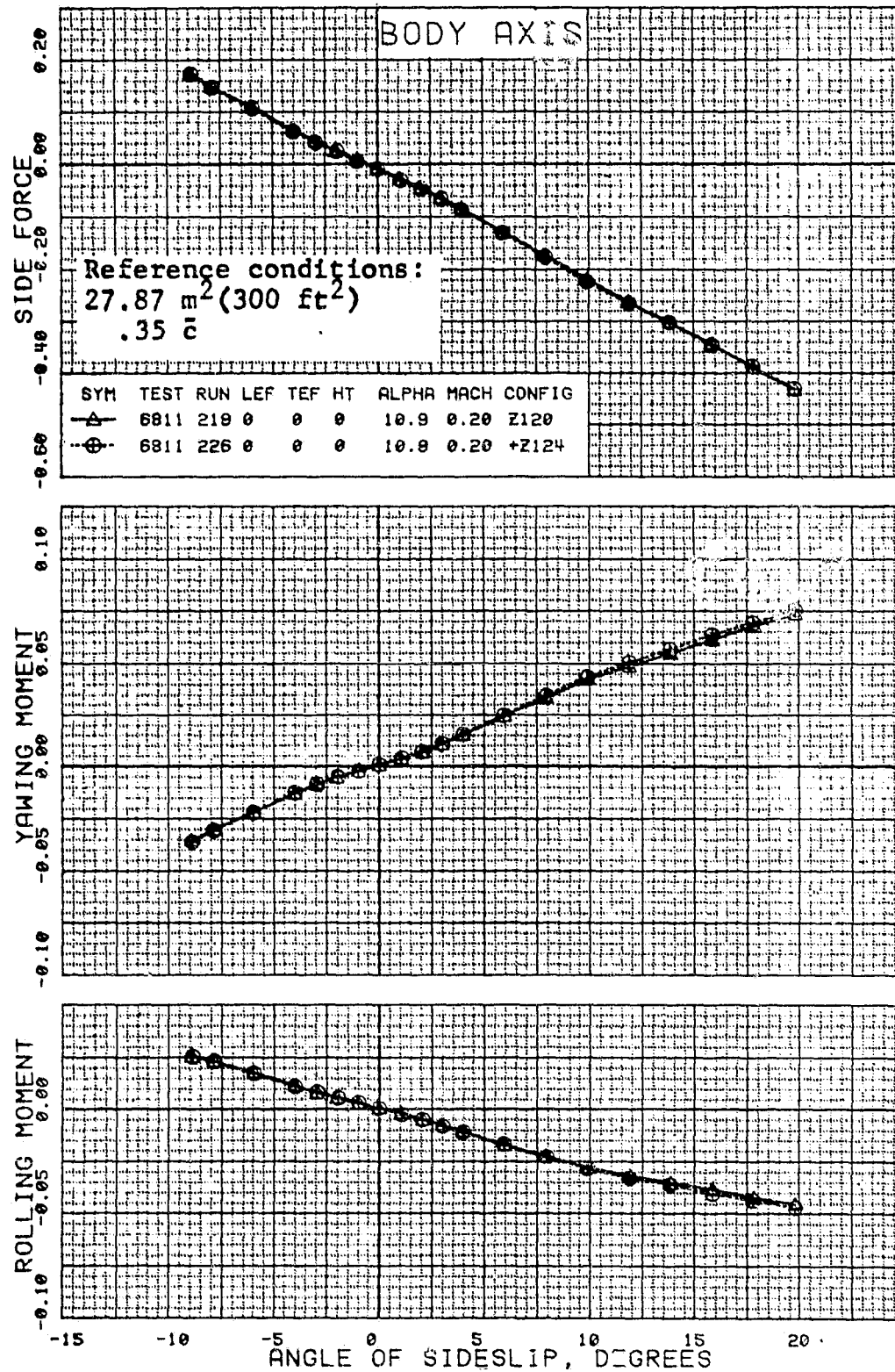


Figure 2-27 (c) Force and Moments, $\alpha = 11^\circ$

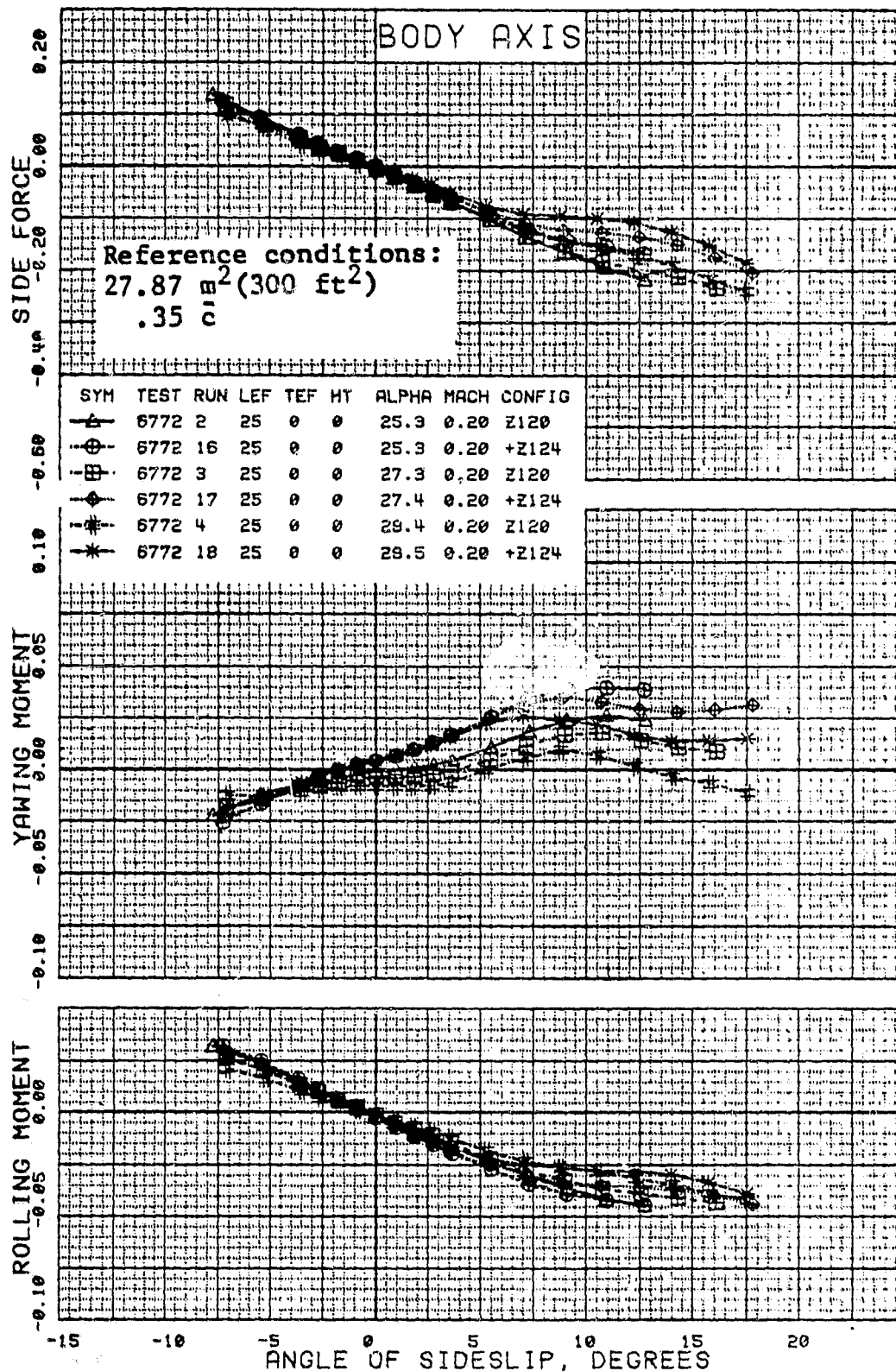


Figure 2-28 Effect of Nose Strake Z124 with nose probe,
 F-16 with Wing W24
 (a) Force and Moments, $\alpha = 25, 27$ and 29°

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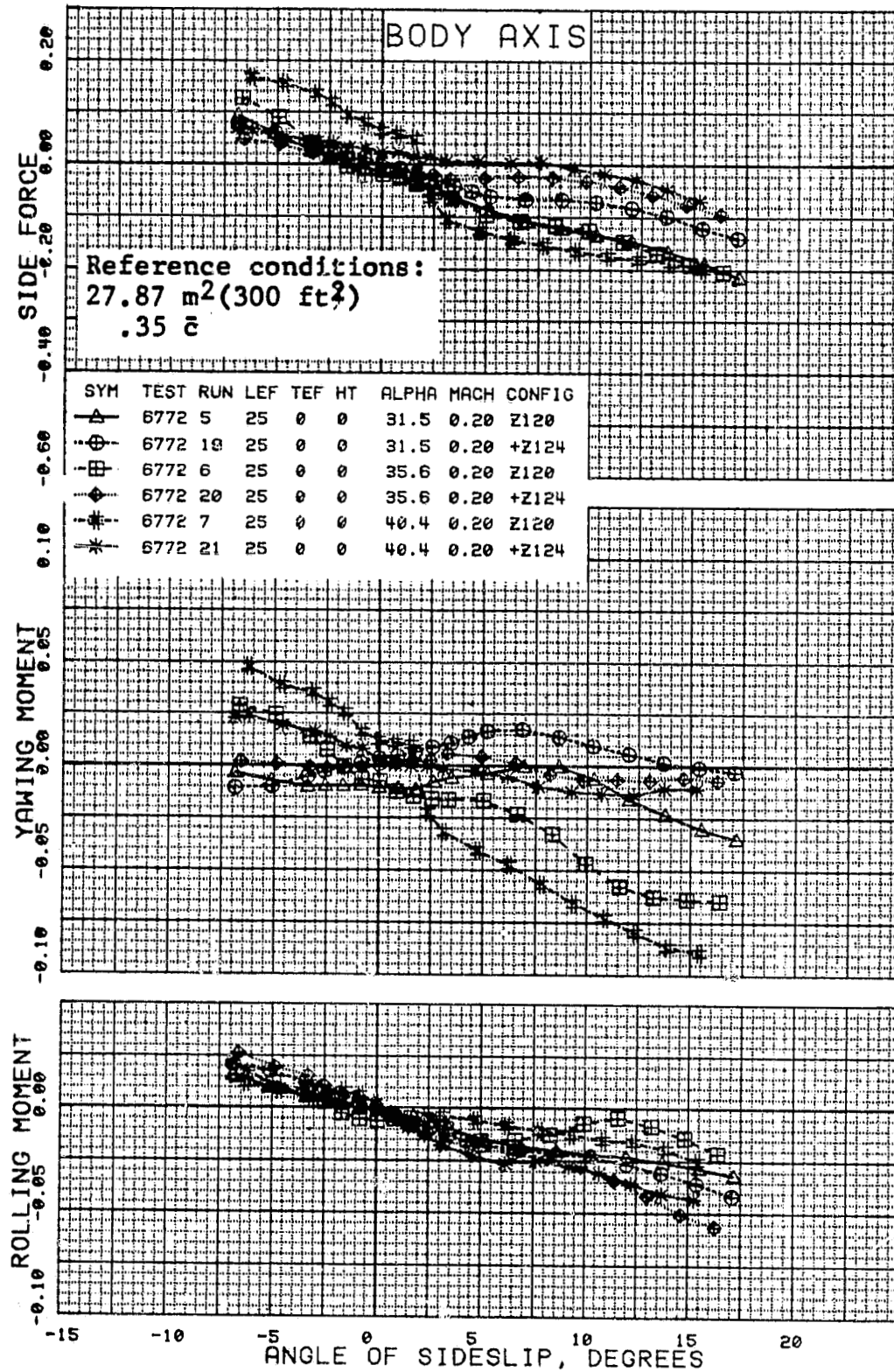


Figure 2-28 (b) Force and Moments, $\alpha=32, 36$ and 40°

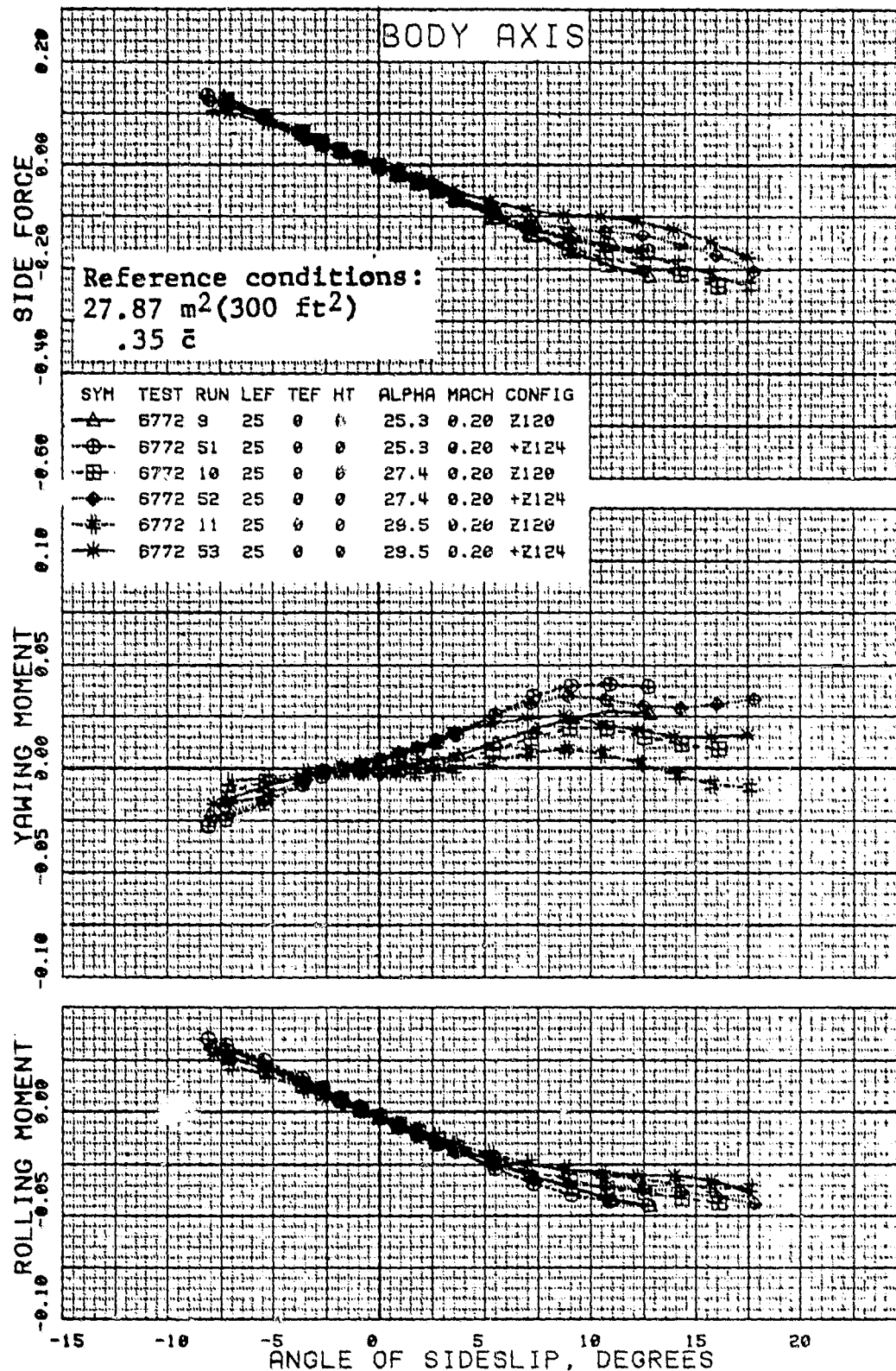


Figure 2-29 Effect of Nose Strake Z124 without nose probe, F-16 with Wing W24
 (a) Force and Moments, $\alpha = 25, 27$ and 30°

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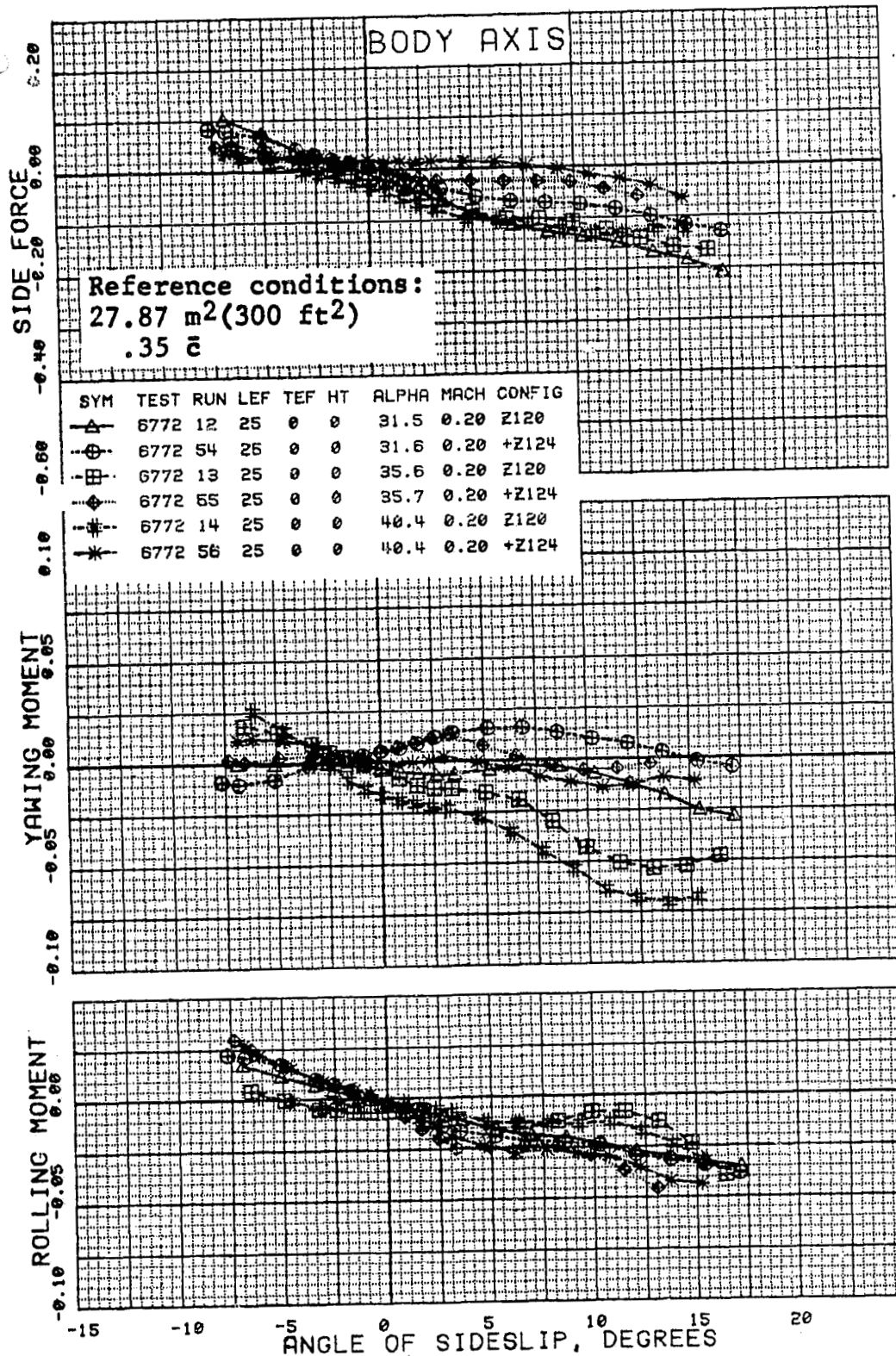


Figure 2-29 (b) Force and Moments, $\alpha=32, 36$ and 40°

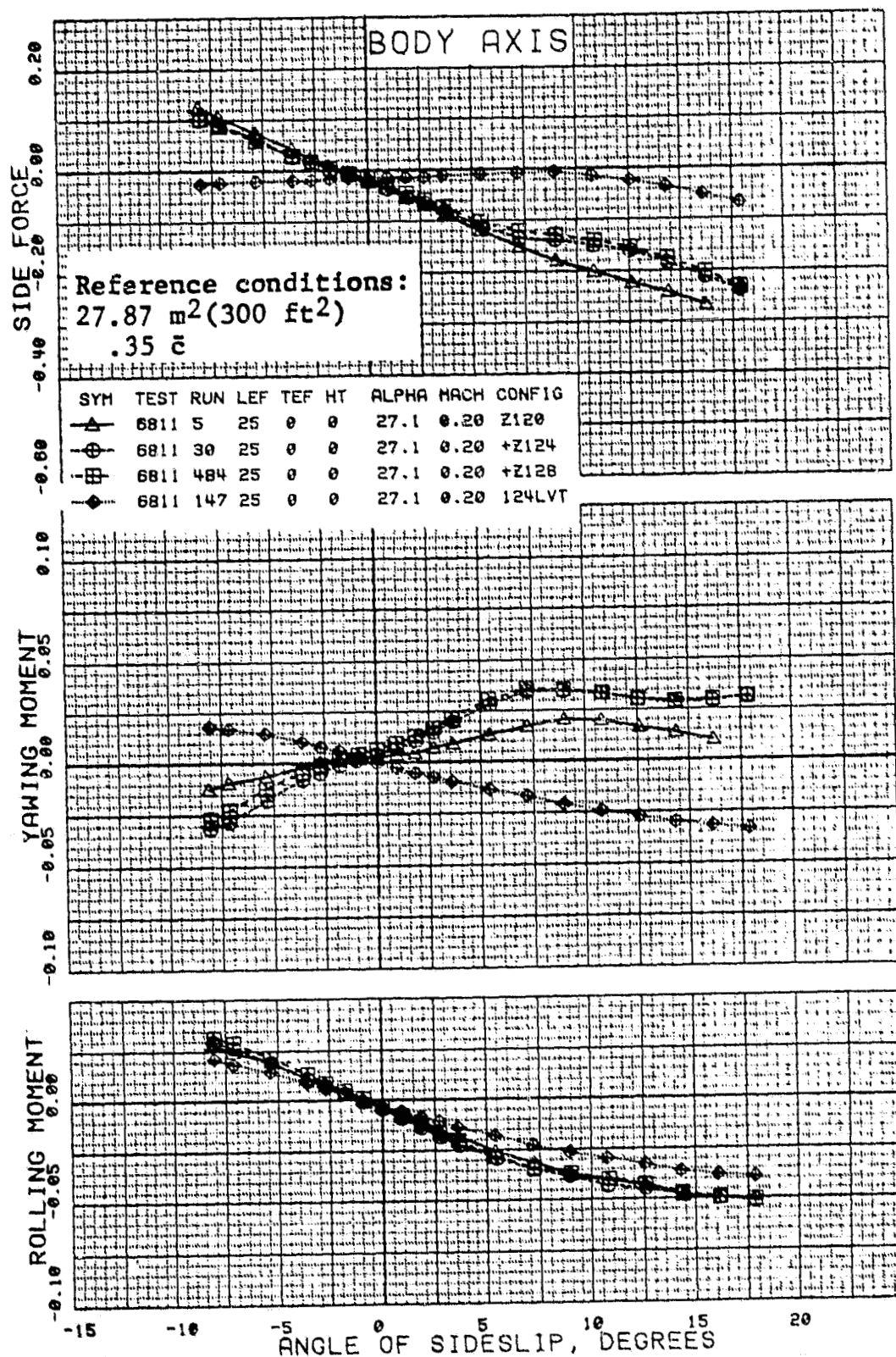


Figure 2-30 Effect of Nose Strake Inclination
(Z124 and Z128), F-16
(a) Force and Moments, $\alpha = 27^\circ$

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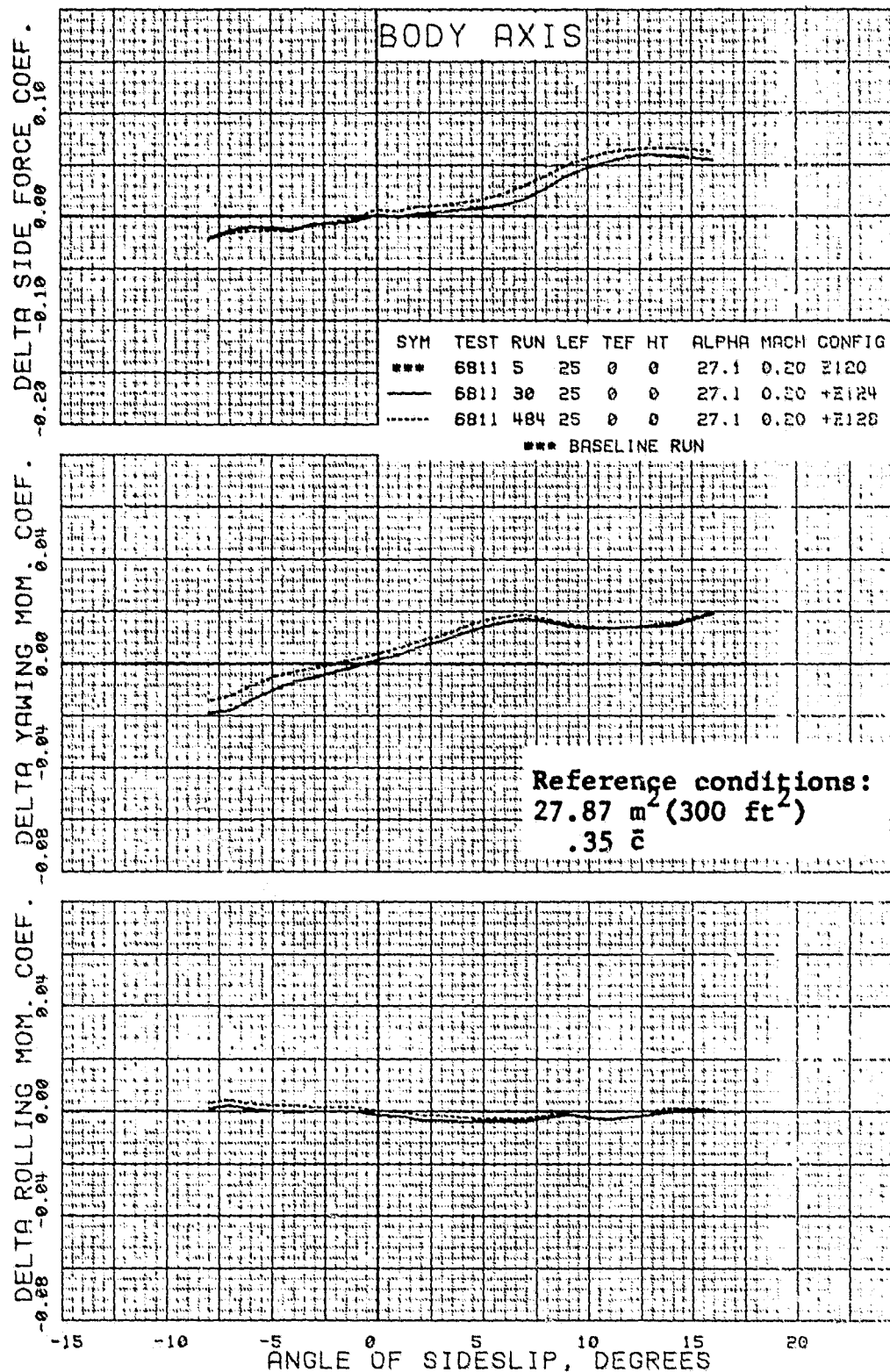


Figure 2-30 (b) Increments, $\alpha=27^\circ$

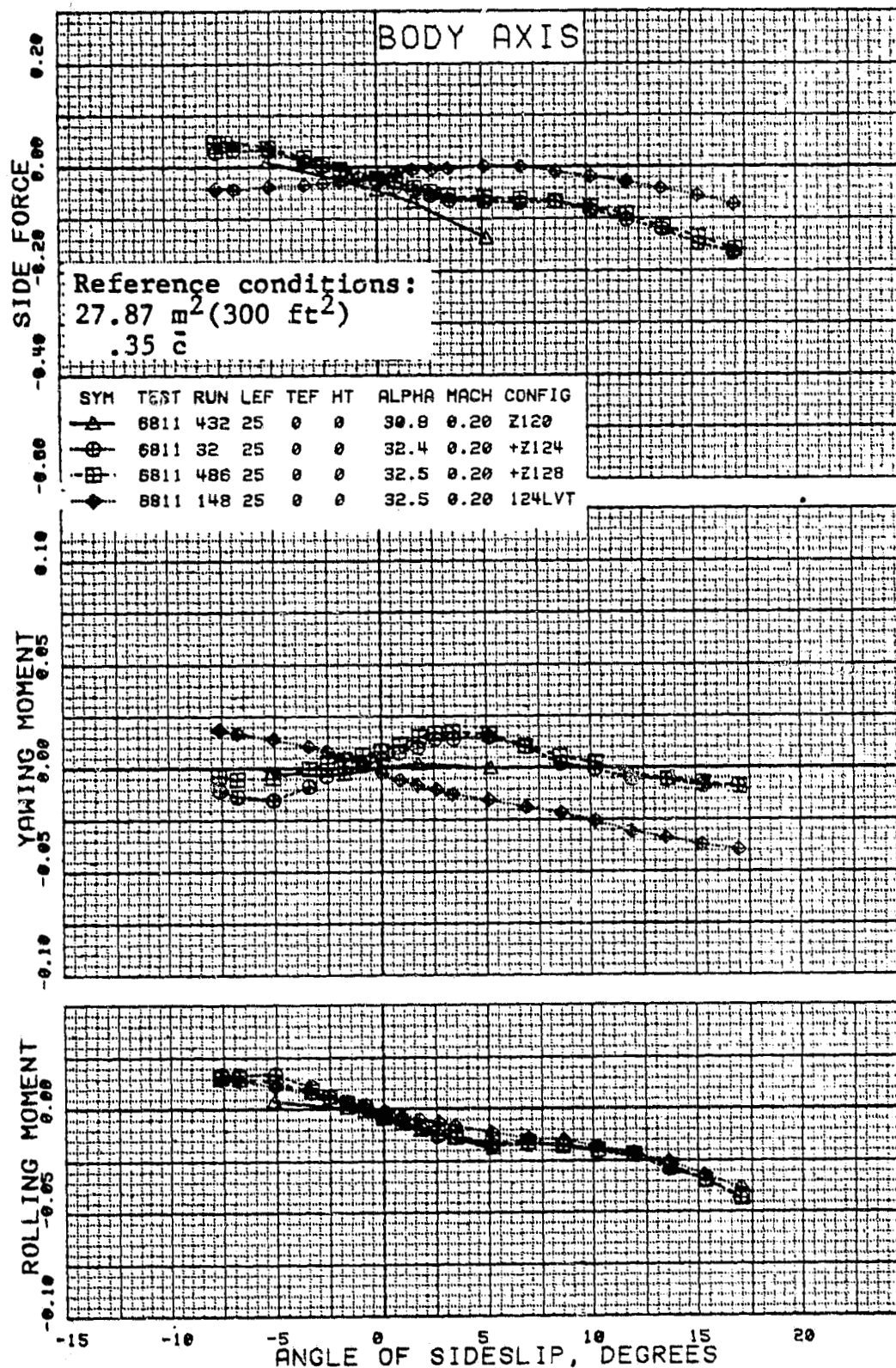


Figure 2-30 (c) Force and Moments, $\alpha = 32^\circ$

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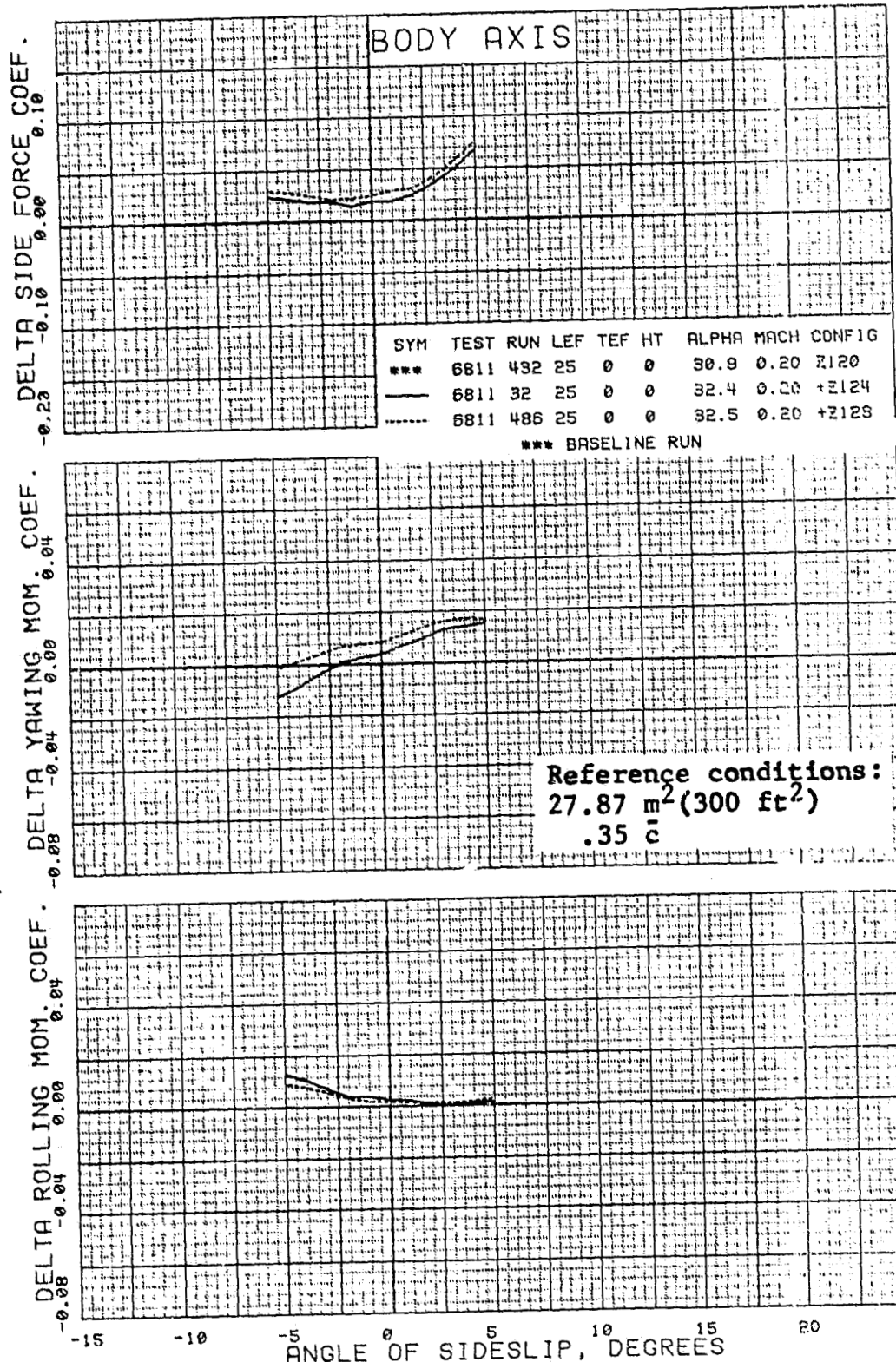


Figure 2-30 (d) Increments, $\alpha = 32^\circ$

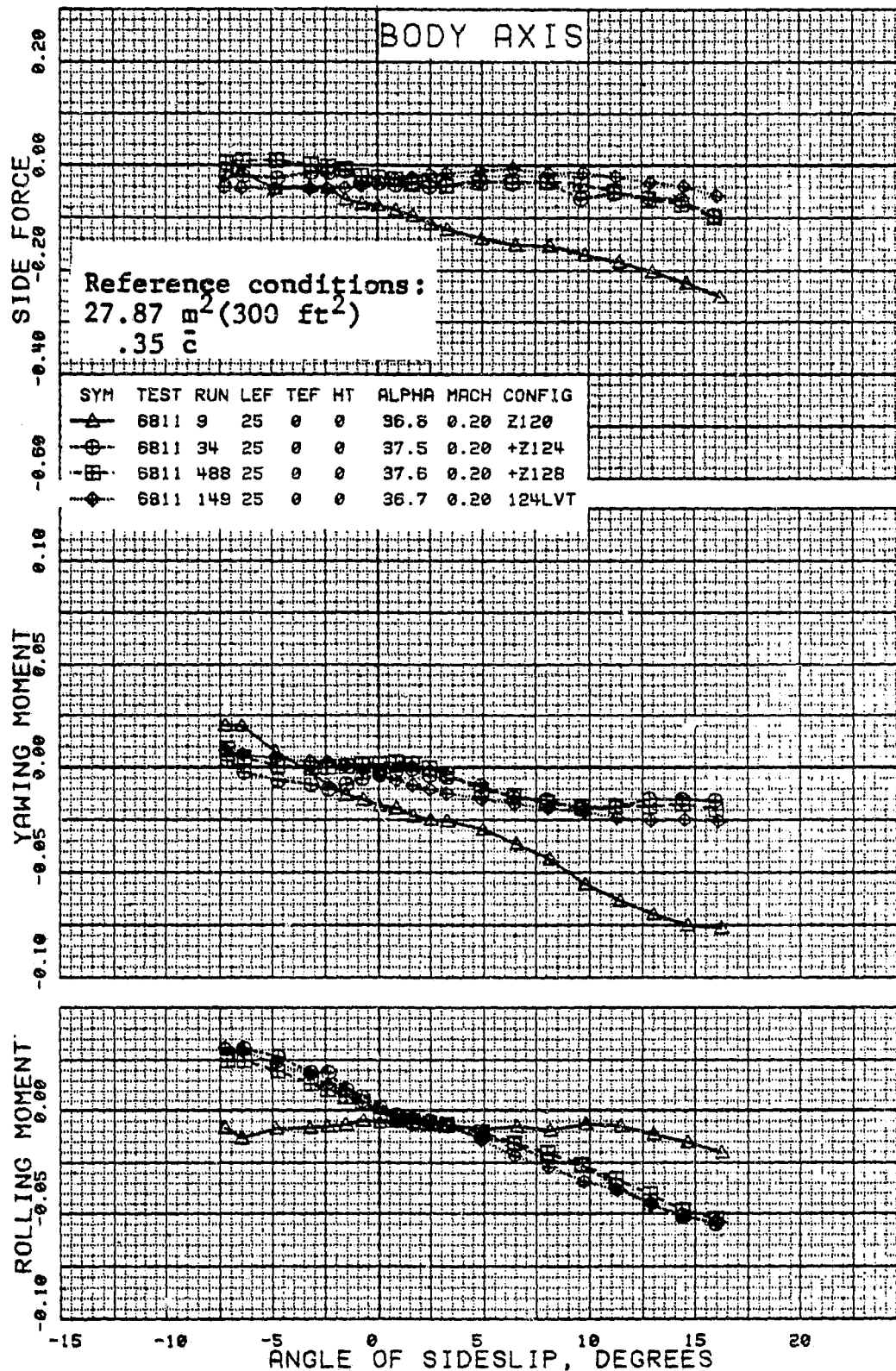


Figure 2-30 (e) Force and Moments, $\alpha=37^\circ$

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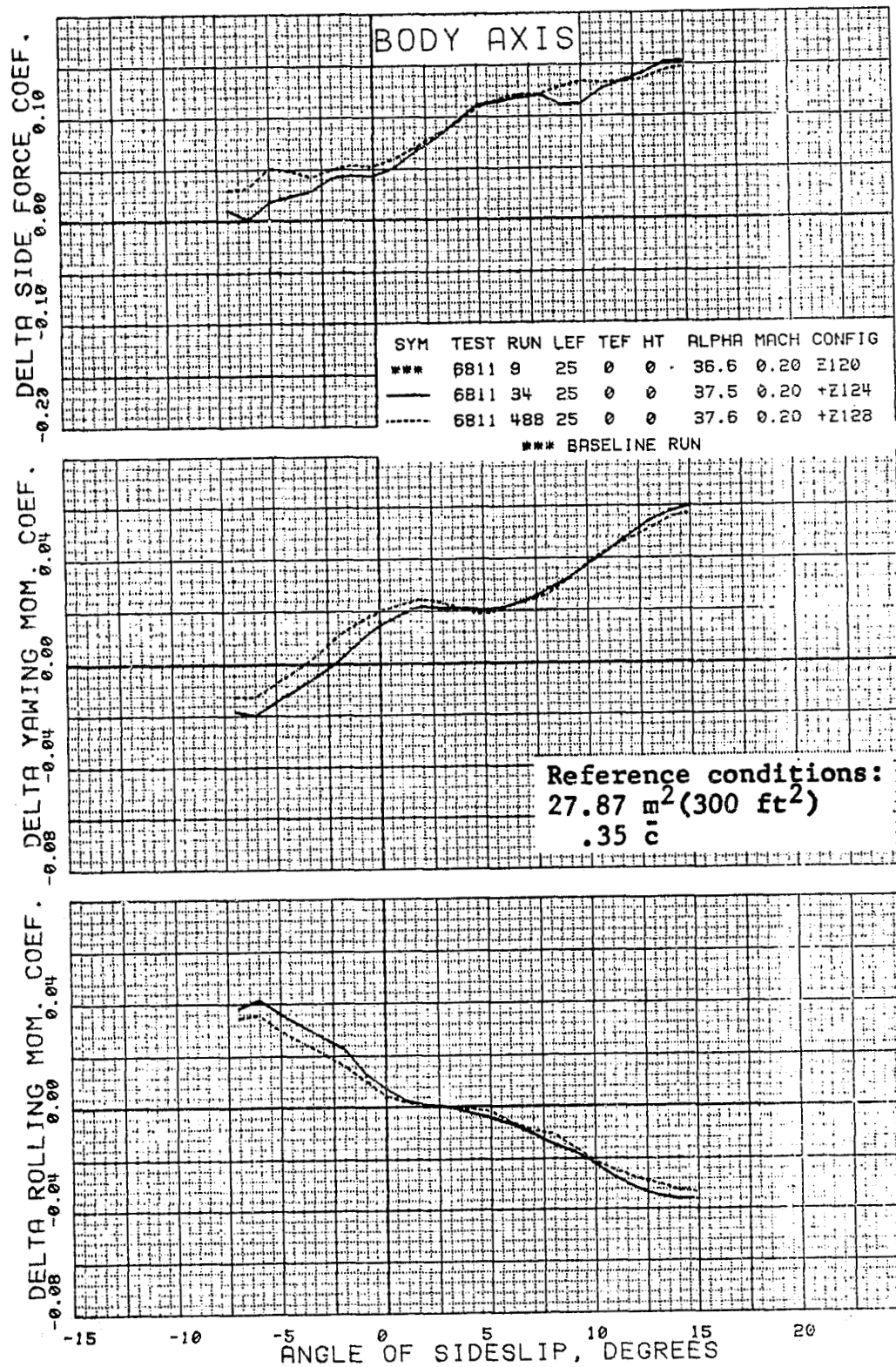


Figure 2-30 (f) Increments, $\alpha=37^\circ$

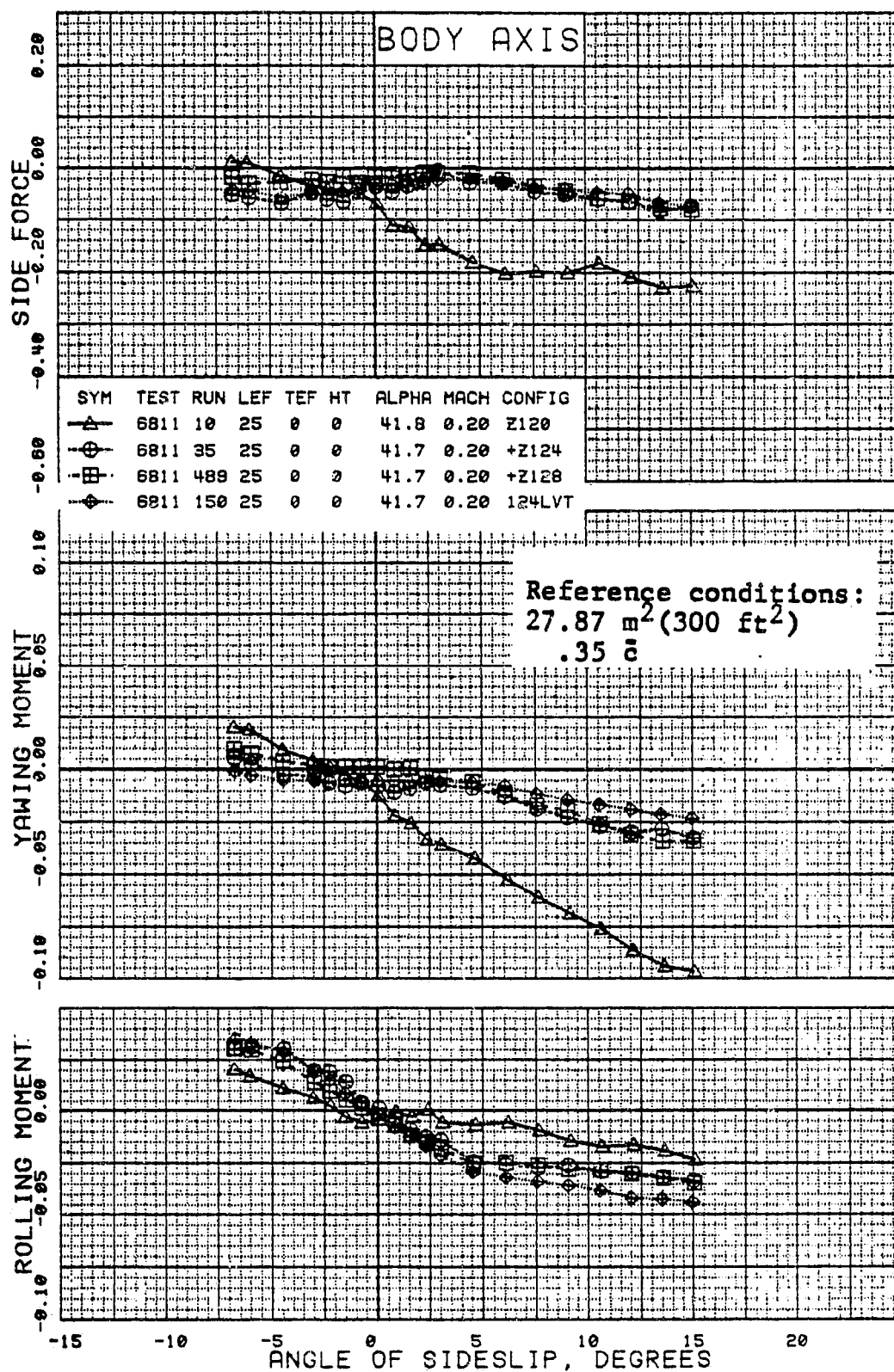


Figure 2-30 (g) Force and Moments, $\alpha=42^\circ$

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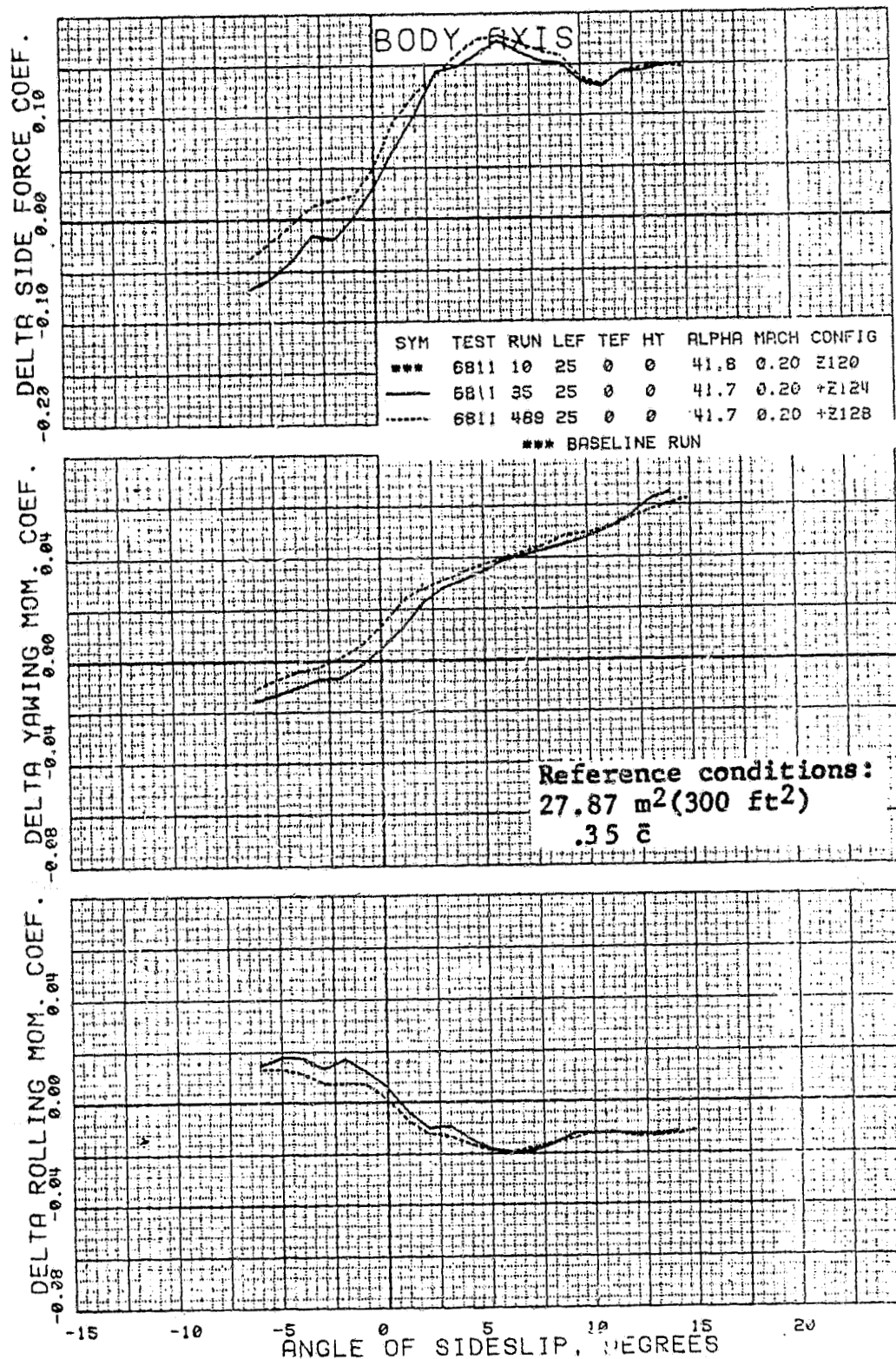


Figure 2-30 (h) Increments, $\alpha=42^\circ$

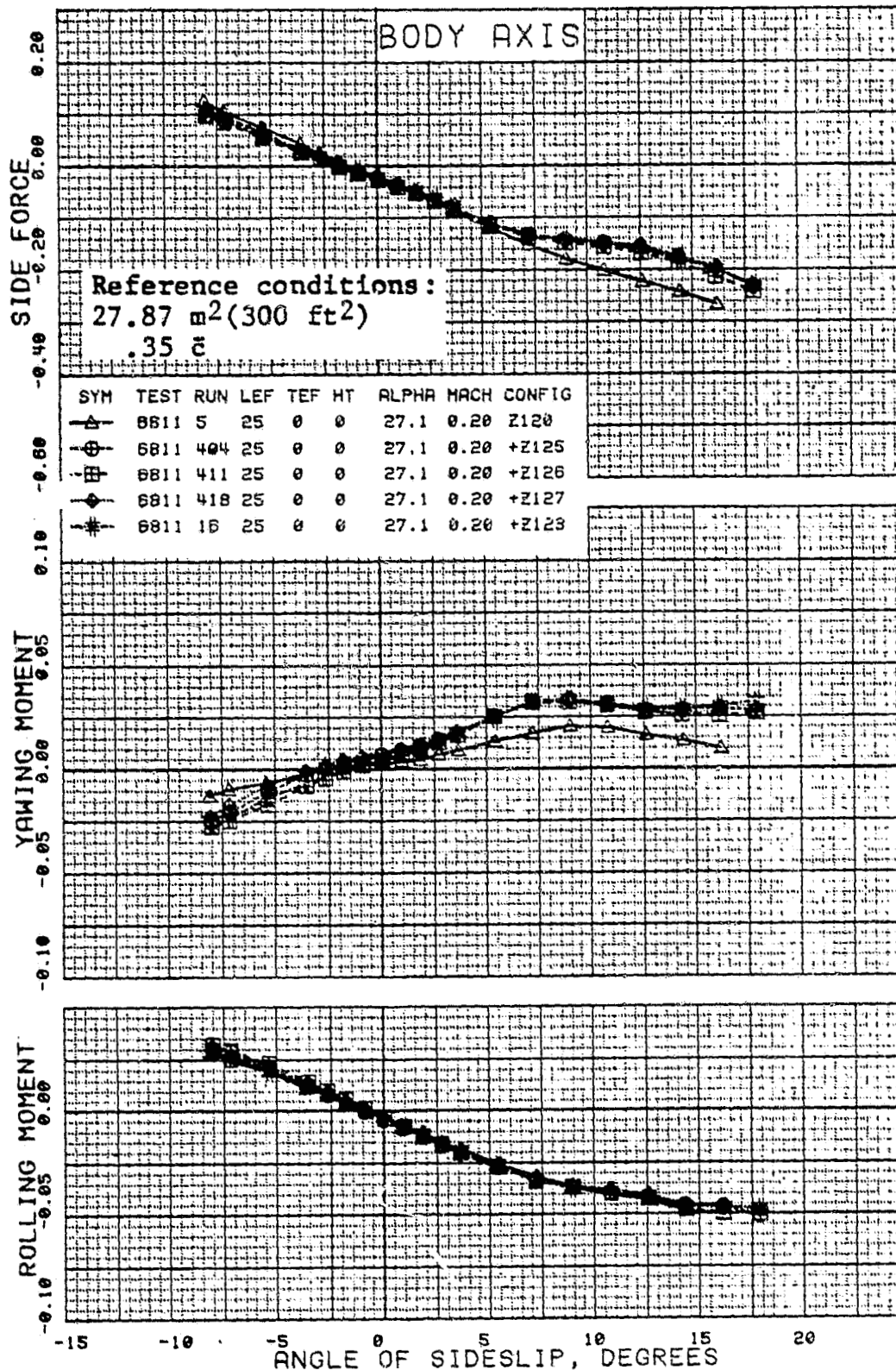


Figure 2-31 Effect of Nose Strakes Z123-Z127, F-16
 (a) Force and Moments, $\alpha=27^\circ$

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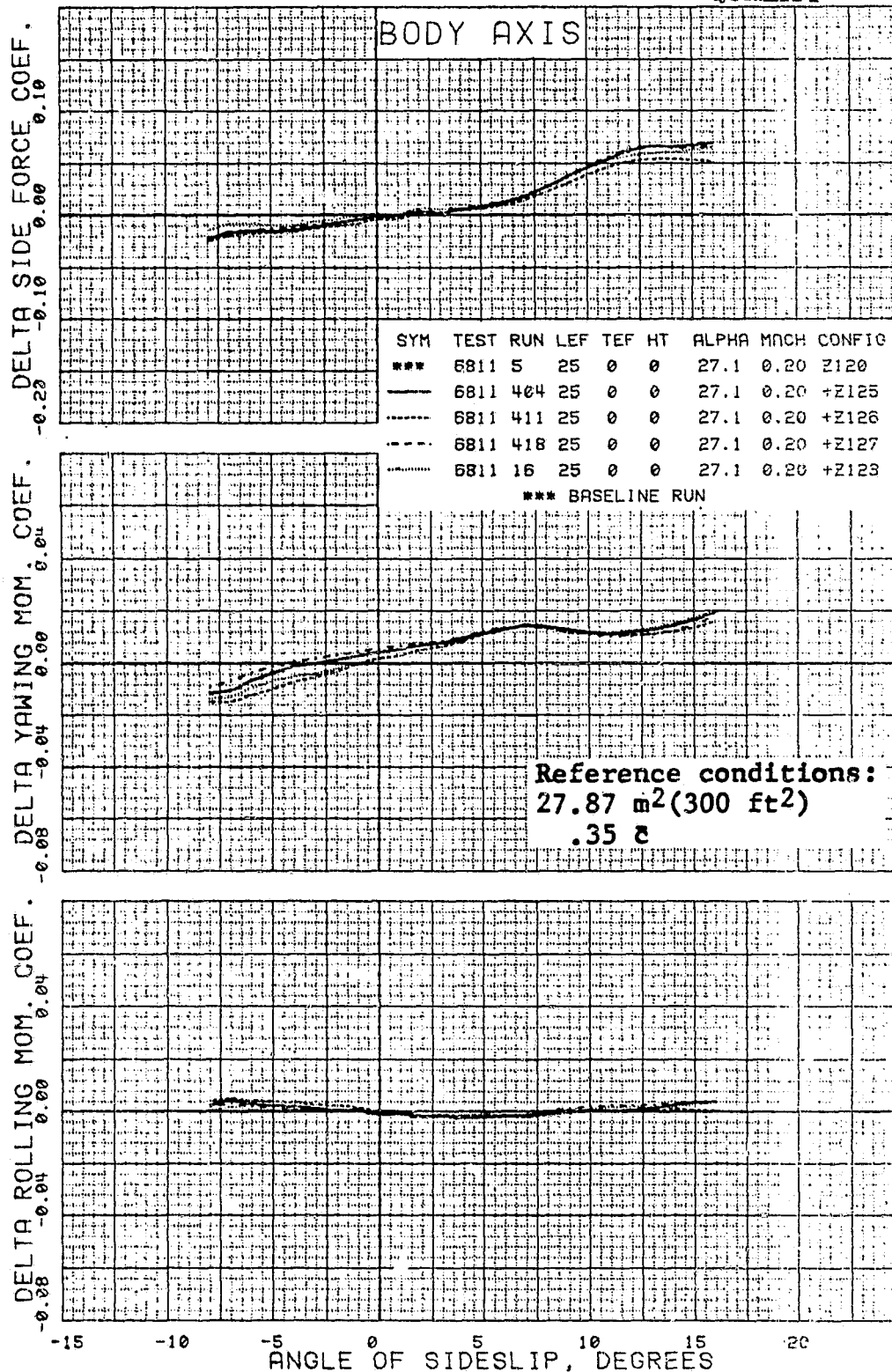


Figure 2-31 (b) Increments, $\alpha=27^\circ$

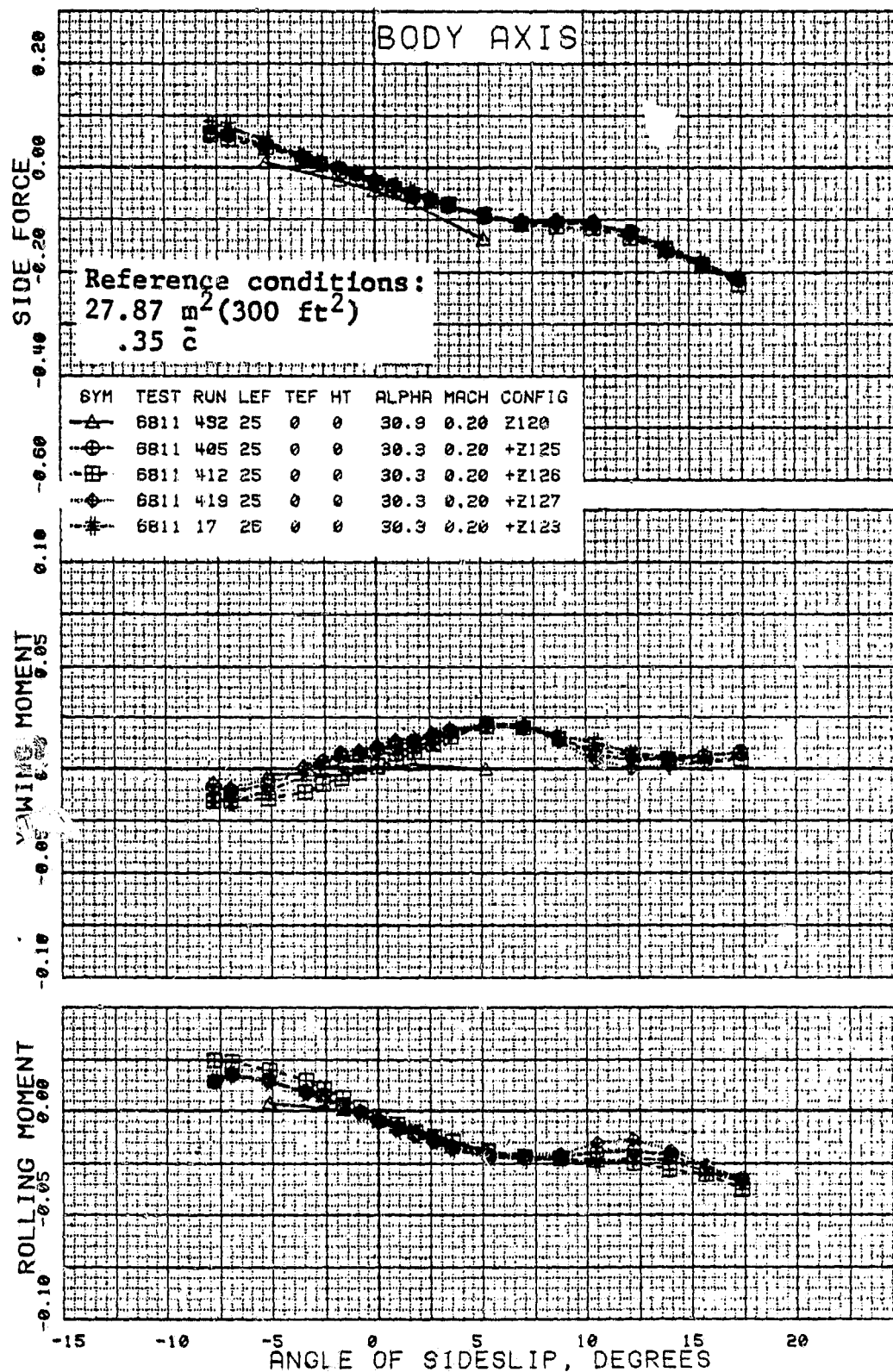


Figure 2-31 (c) Force and Moments, $\alpha = 30^\circ$

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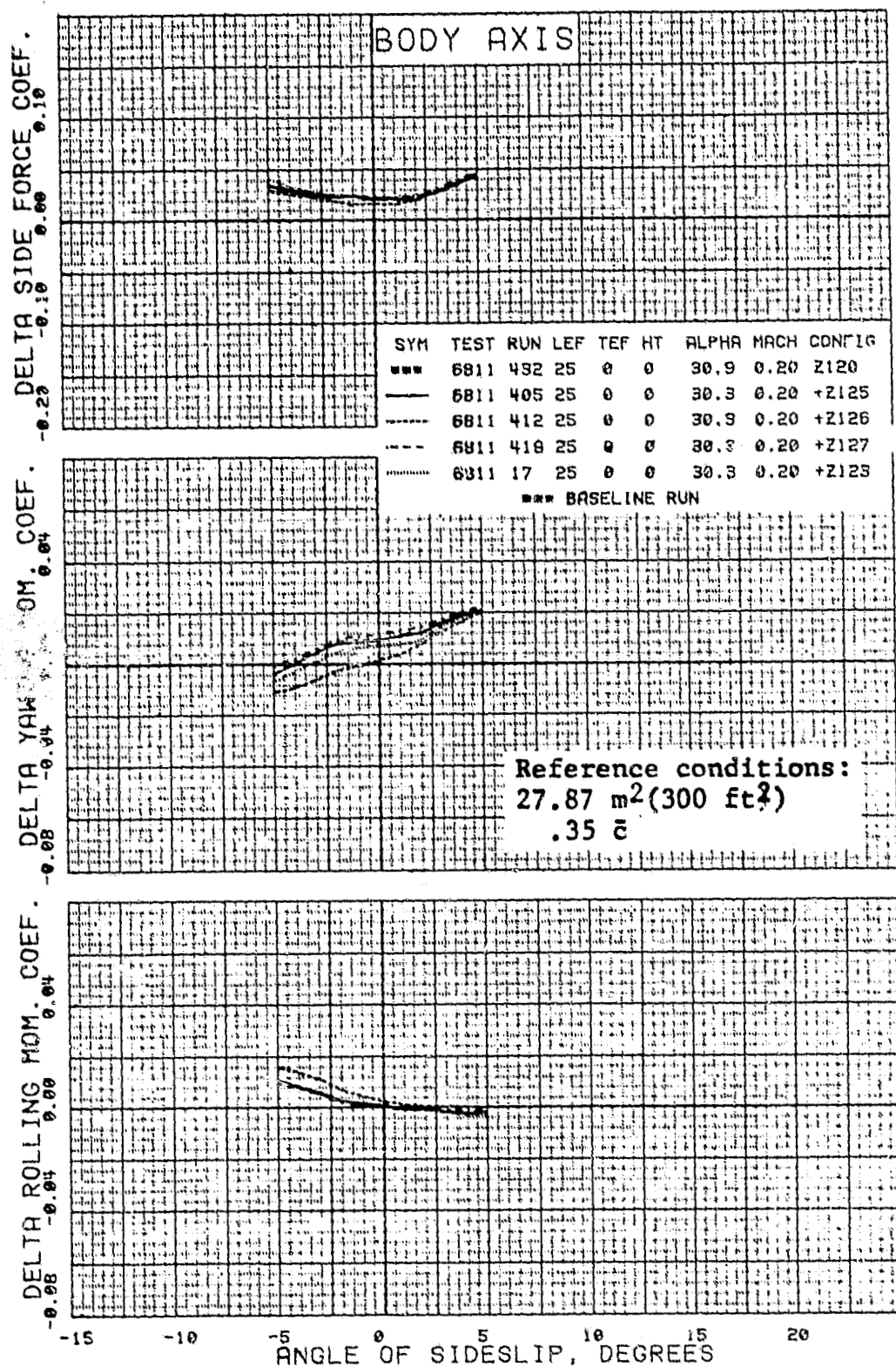


Figure 2-31 (d) Increments, $\alpha = 30^\circ$

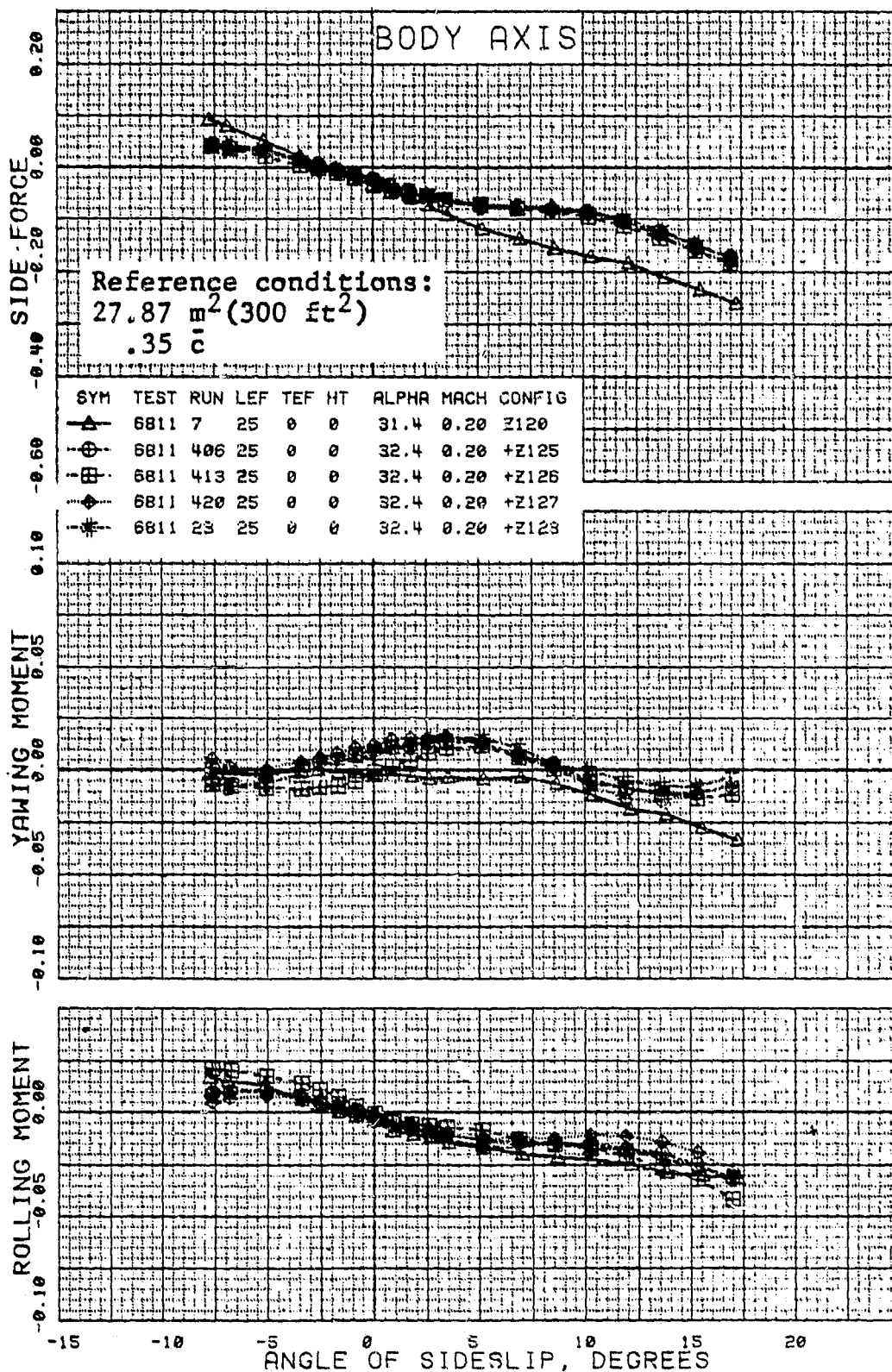


Figure 2-31 (e) Force and Moments, $\alpha = 32^\circ$

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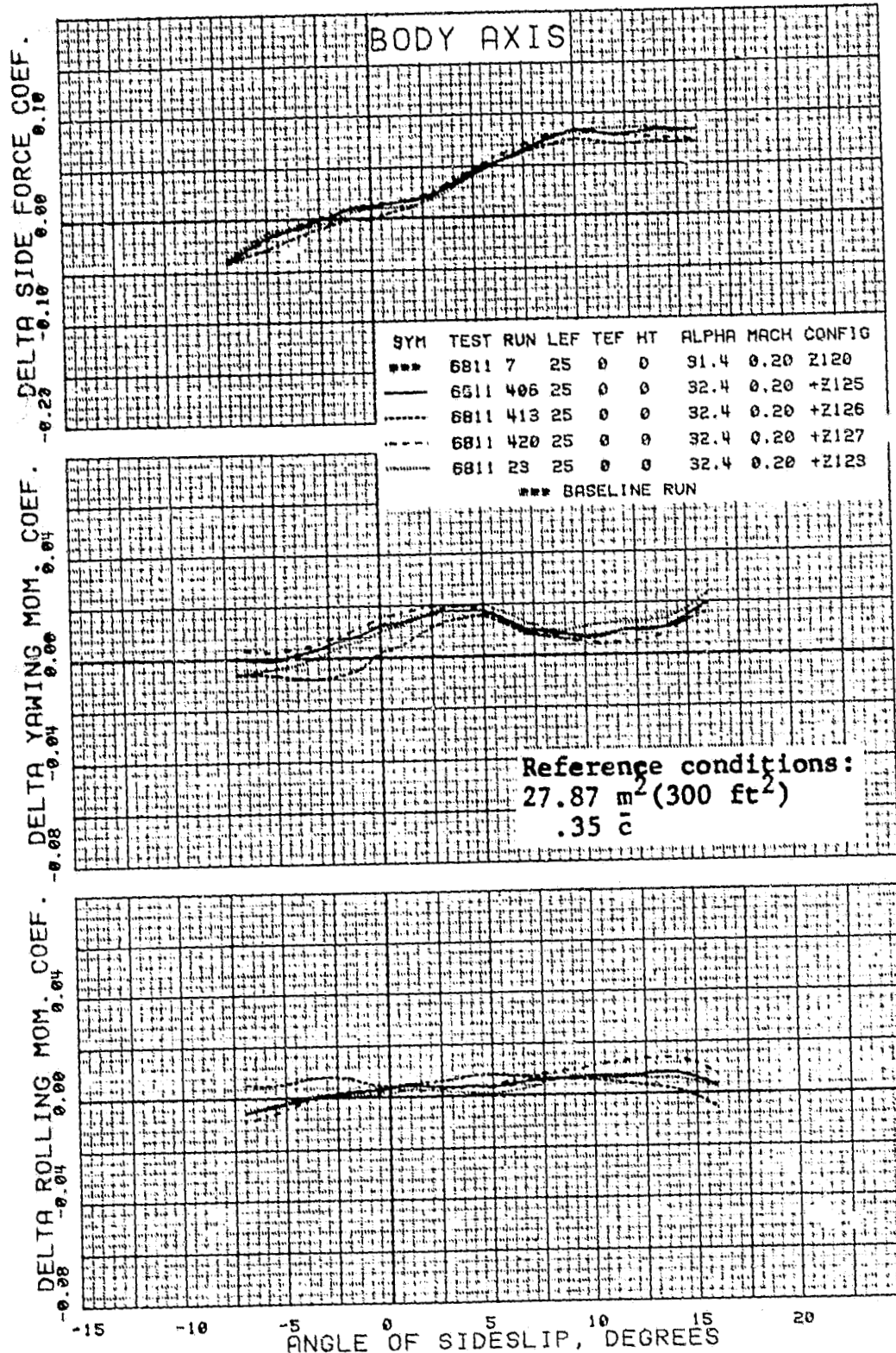


Figure 2-31 (f) Increments, $\alpha = 32^\circ$

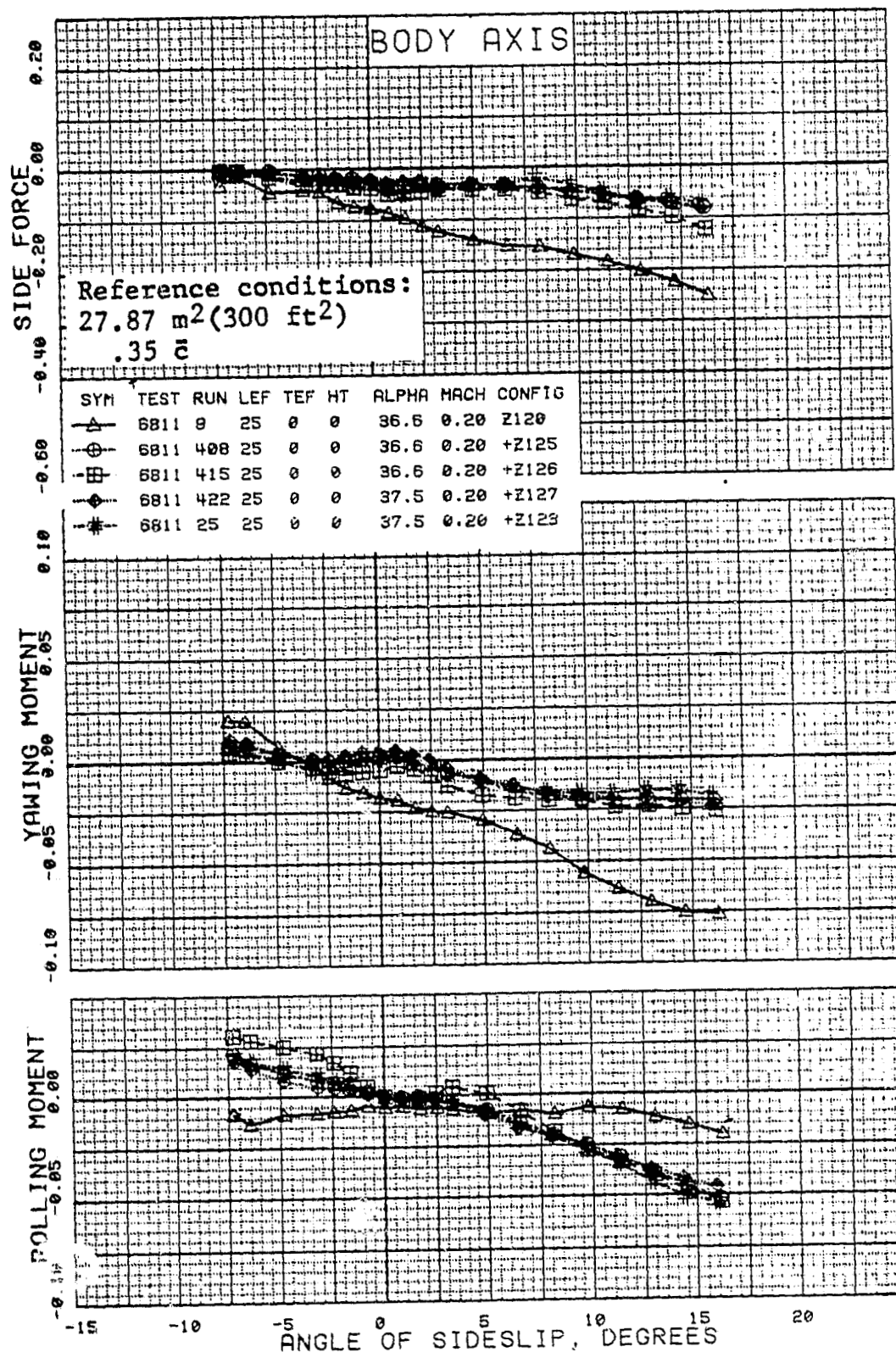


Figure 2-31 (g) Force and Moments, $\alpha = 37^\circ$

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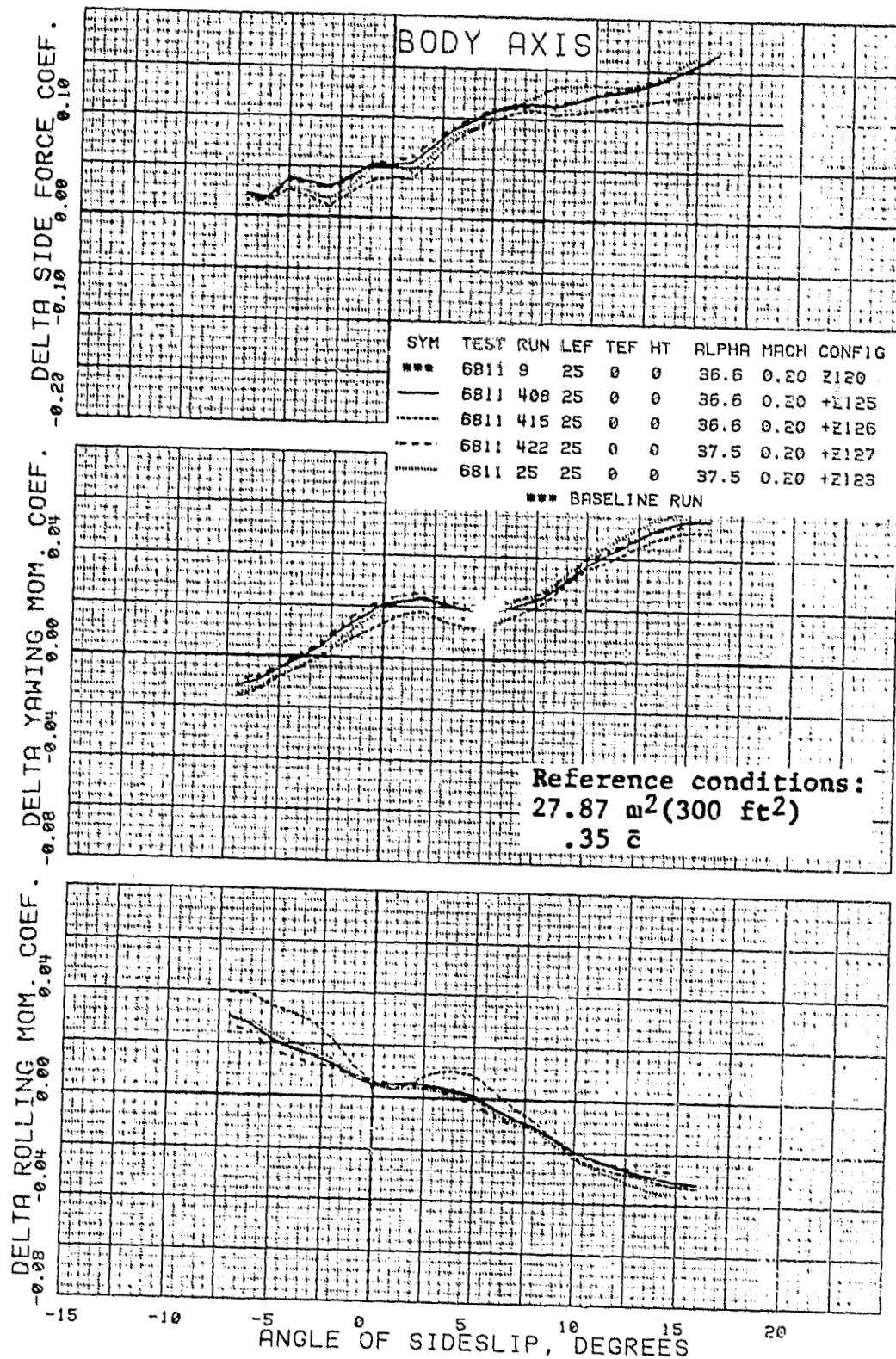


Figure 2-31 (h) Increments, $\alpha = 37^\circ$

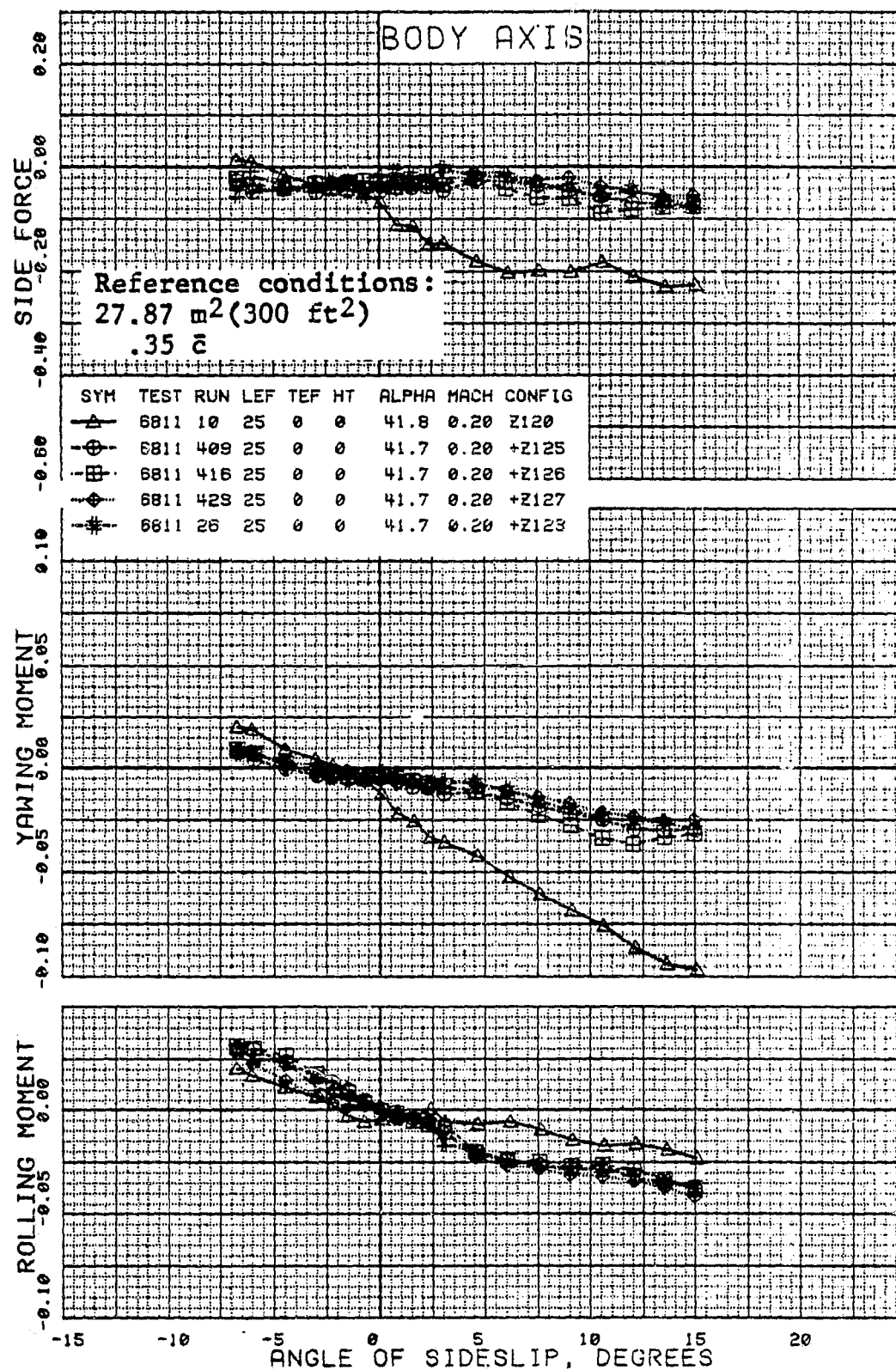


Figure 2-31 (i) Force and Moments, $\alpha = 42^\circ$

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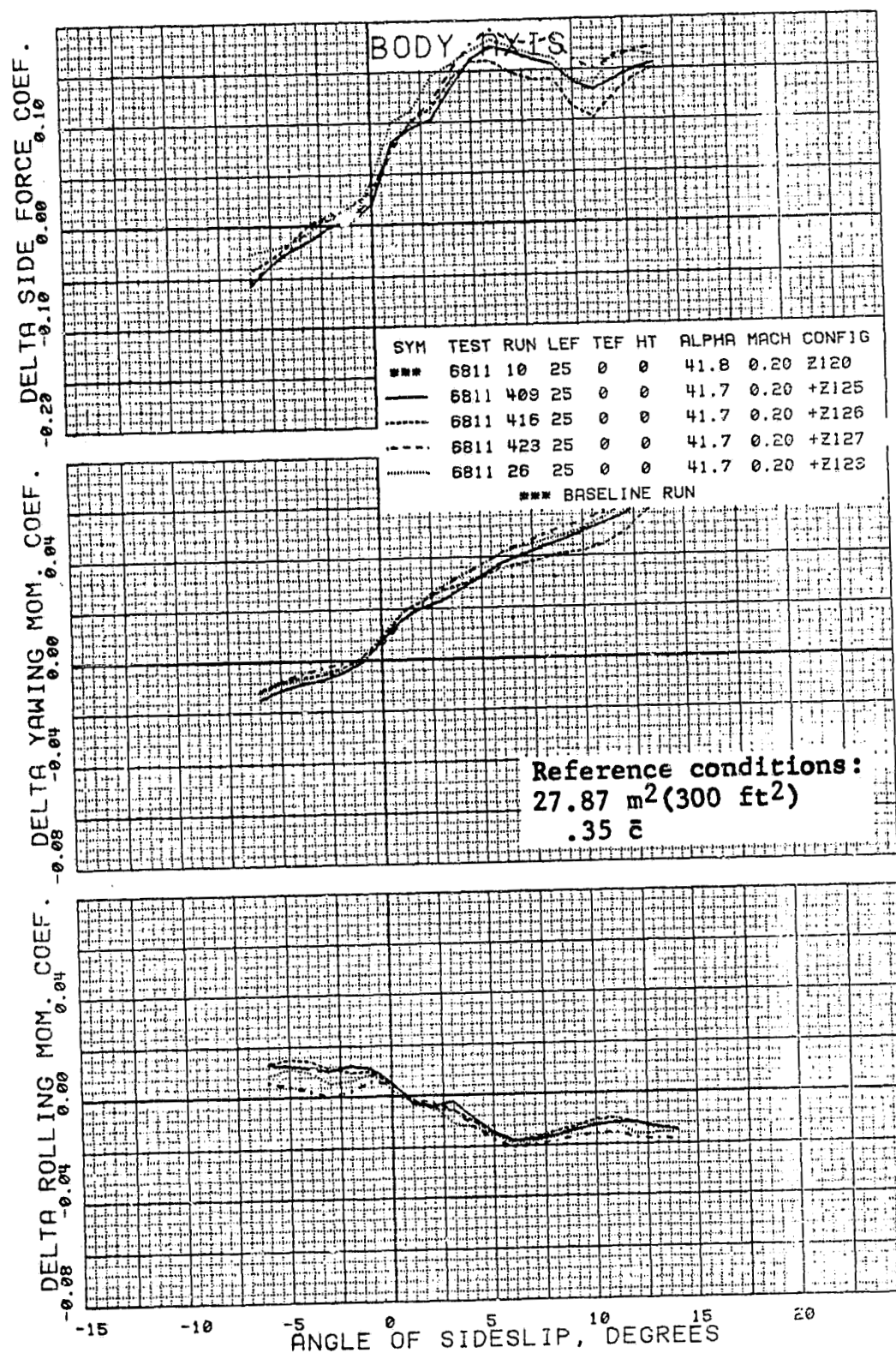


Figure 2-31 (j) Increments, $\alpha = 42^\circ$

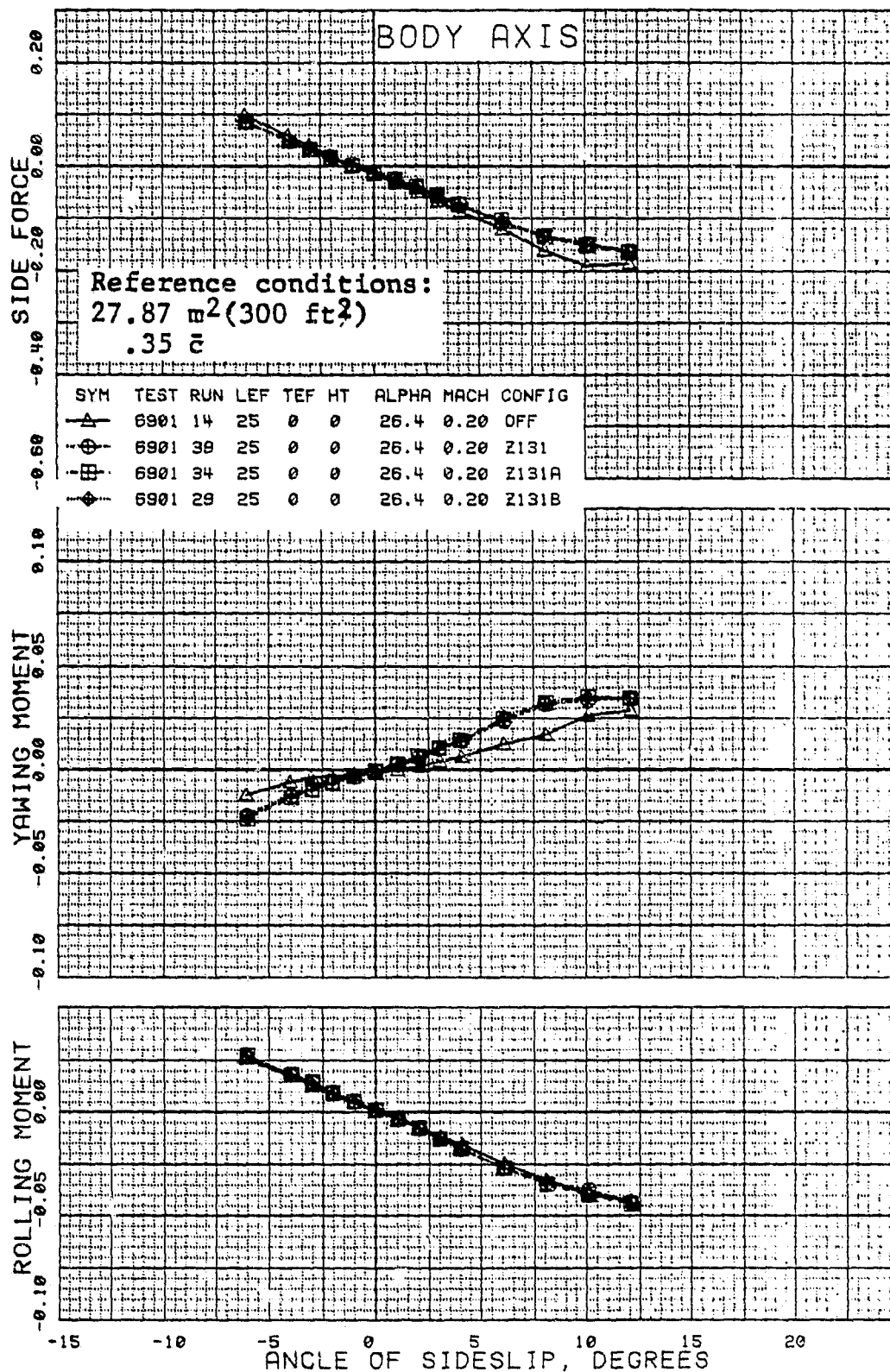


Figure 2-32 - Effect of Nose Stroke Length
 (Z131,Z131A,Z131B), F-16
 (a) Force and Moments, $\alpha = 26^\circ$

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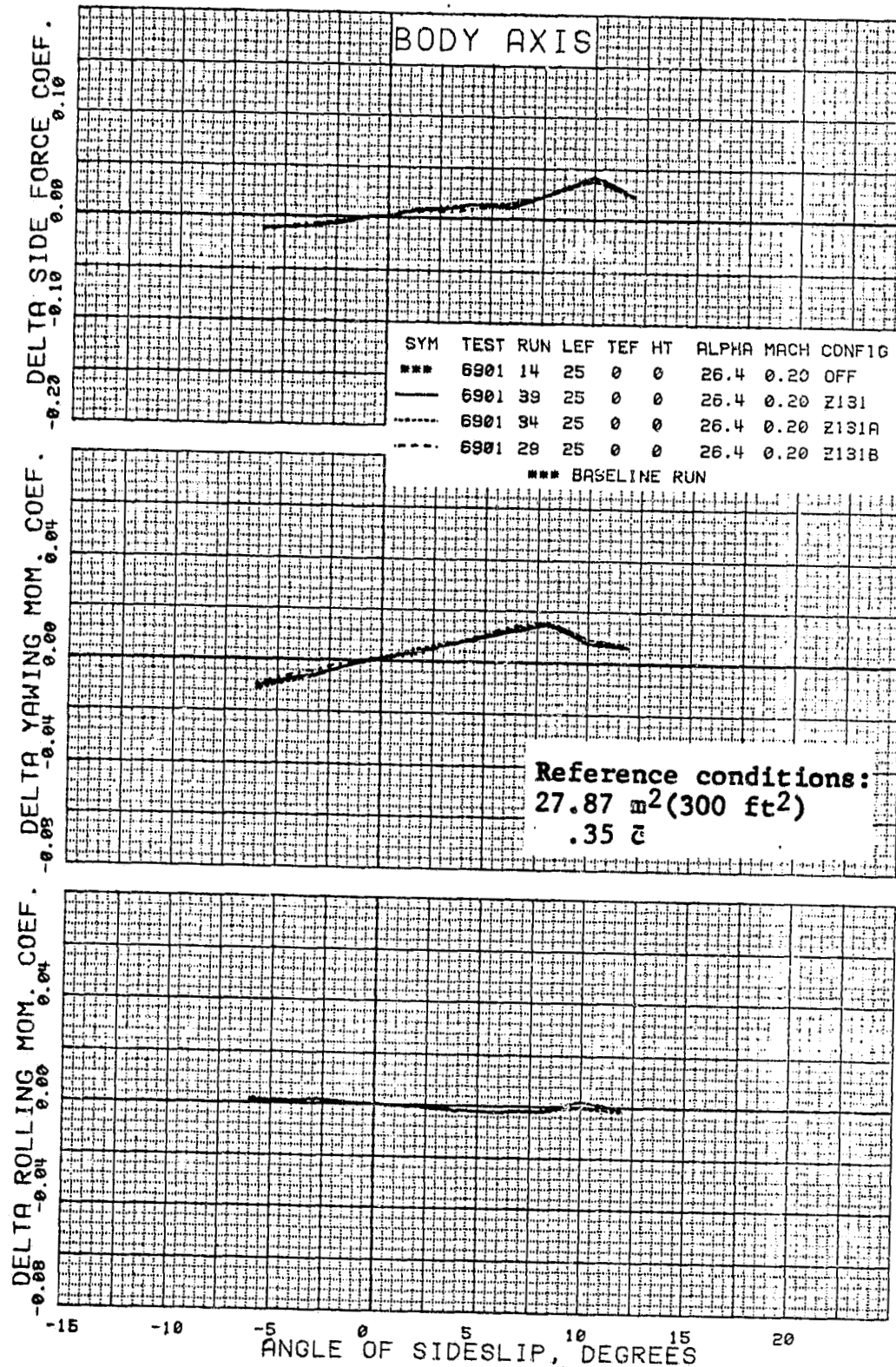


Figure 2-32 (b) Increments, $\alpha = 26^\circ$

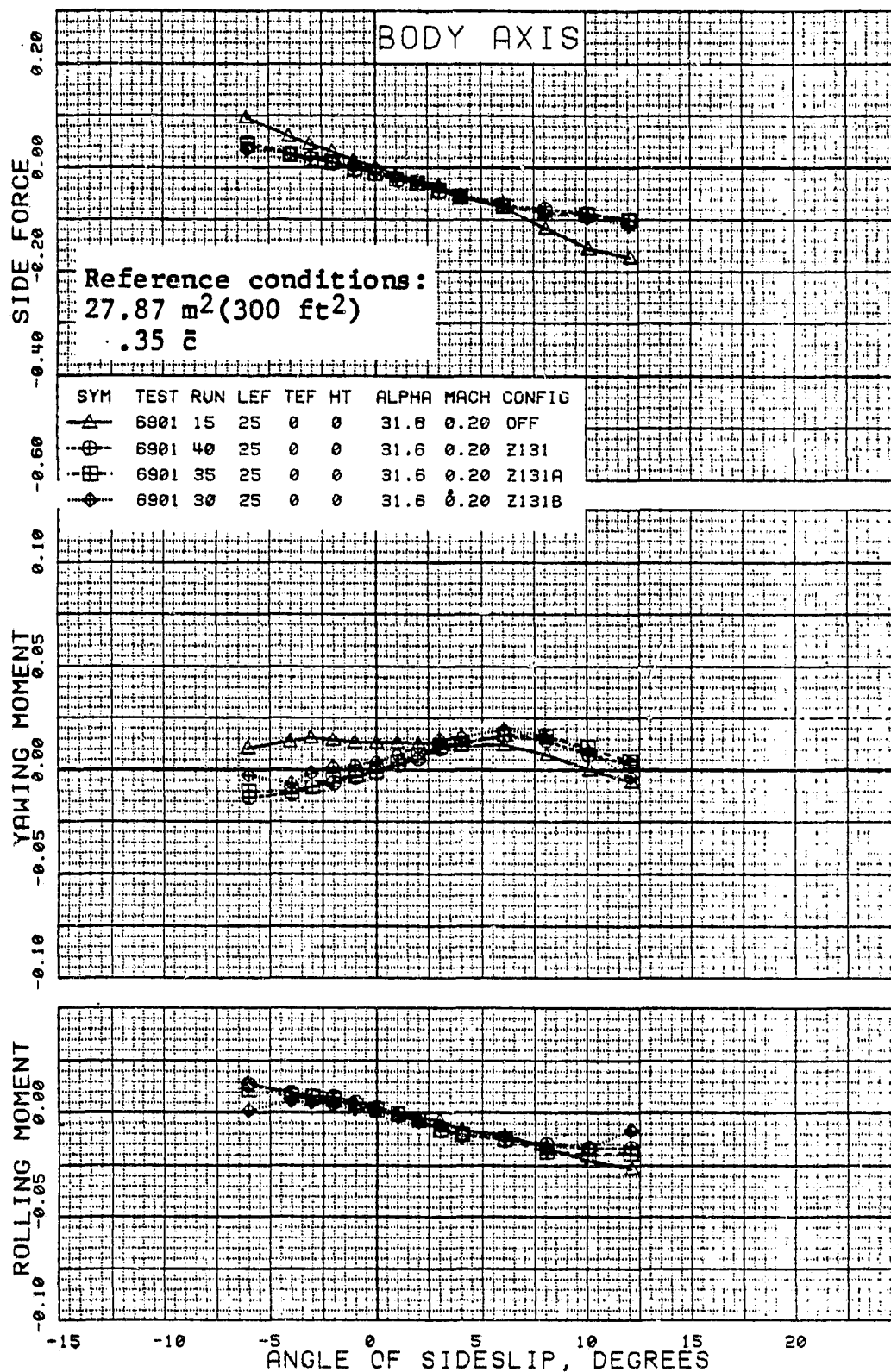


Figure 2-32 (c) Force and Moments, $\alpha=32^\circ$

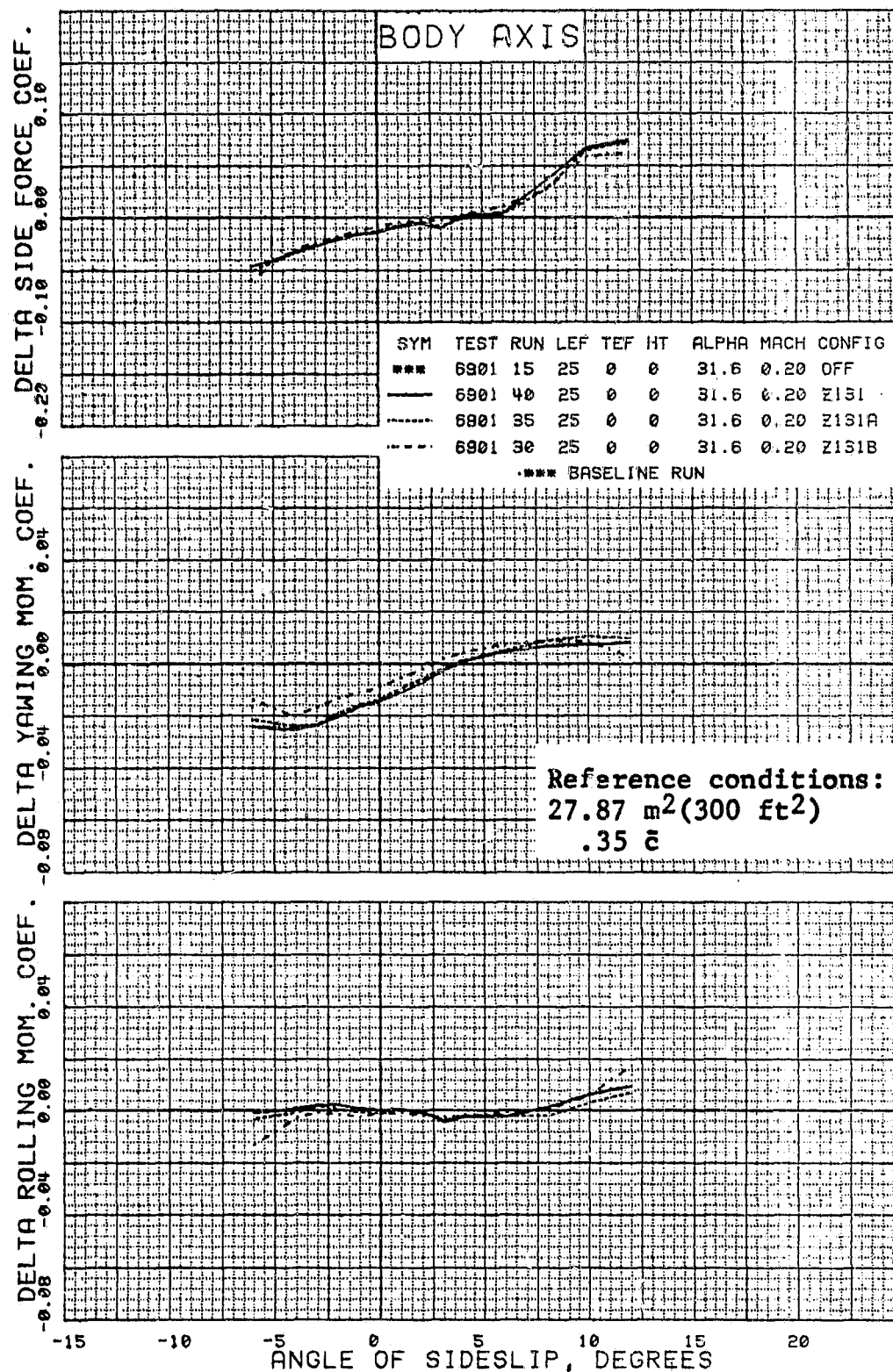


Figure 2-32 (d) Increments, $\alpha = 32^\circ$

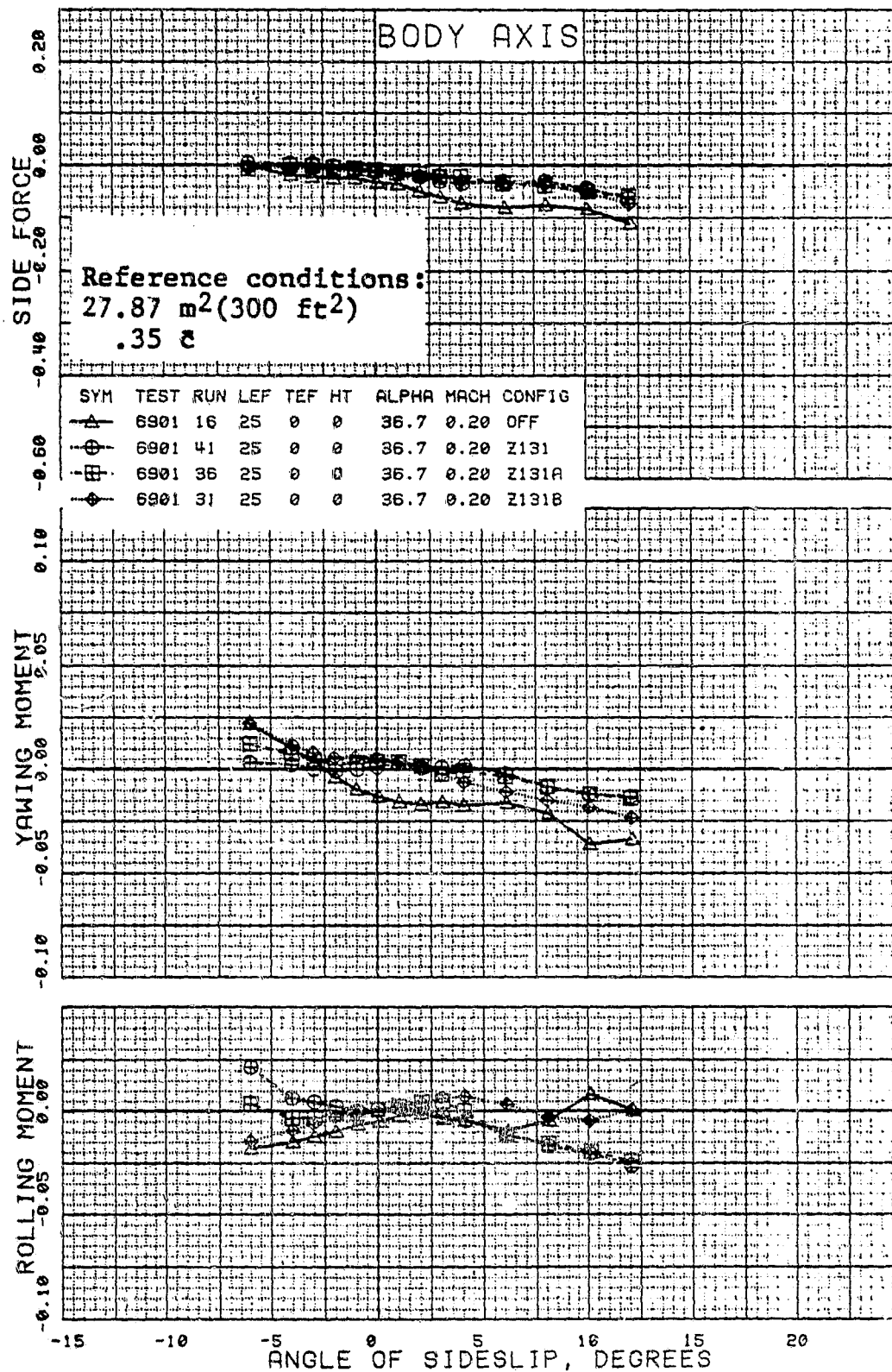


Figure 2-32 (e) Force and Moments, $\alpha=37^\circ$

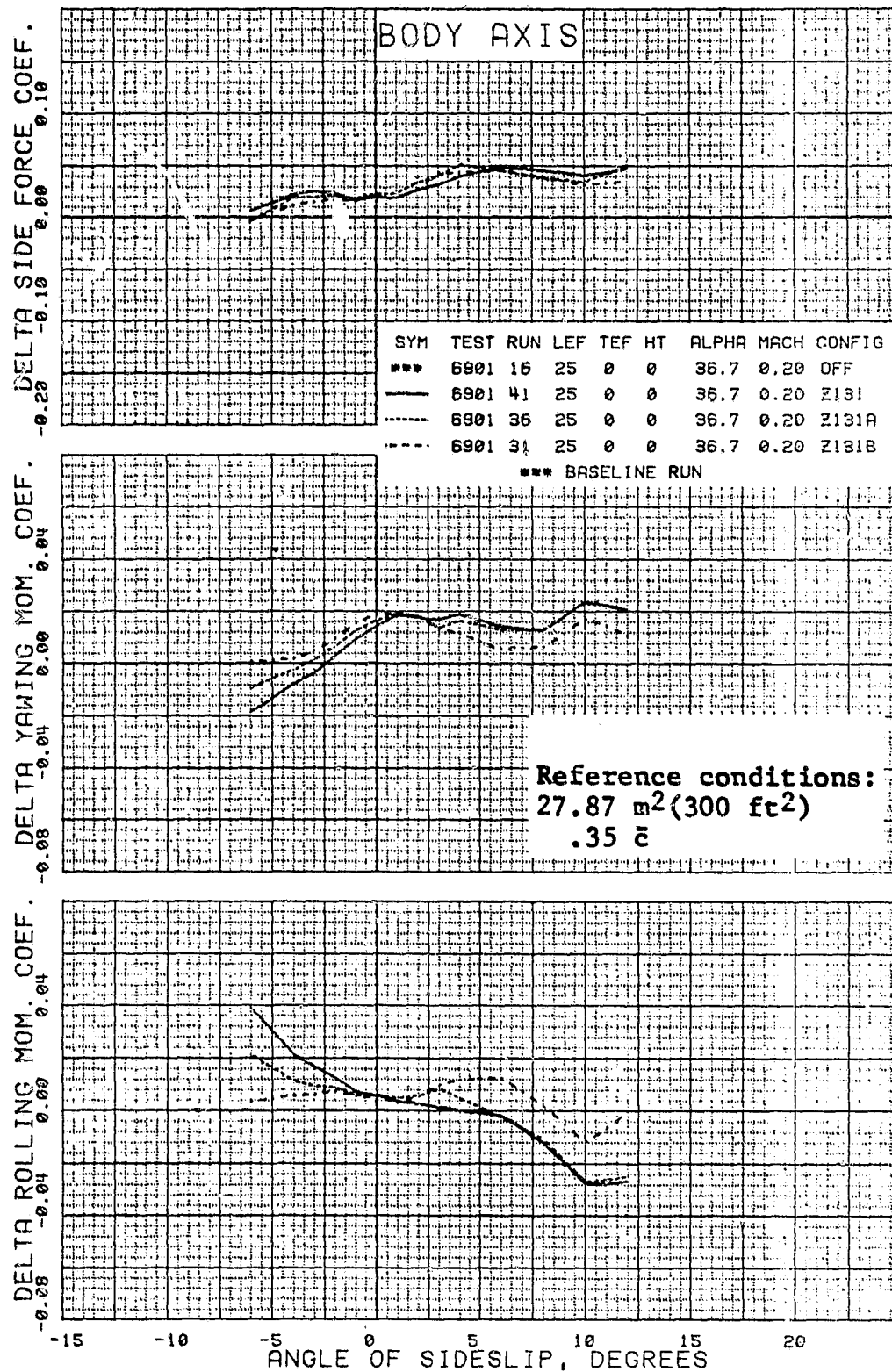


Figure 2-32 (f) Increments, $\alpha=37^\circ$

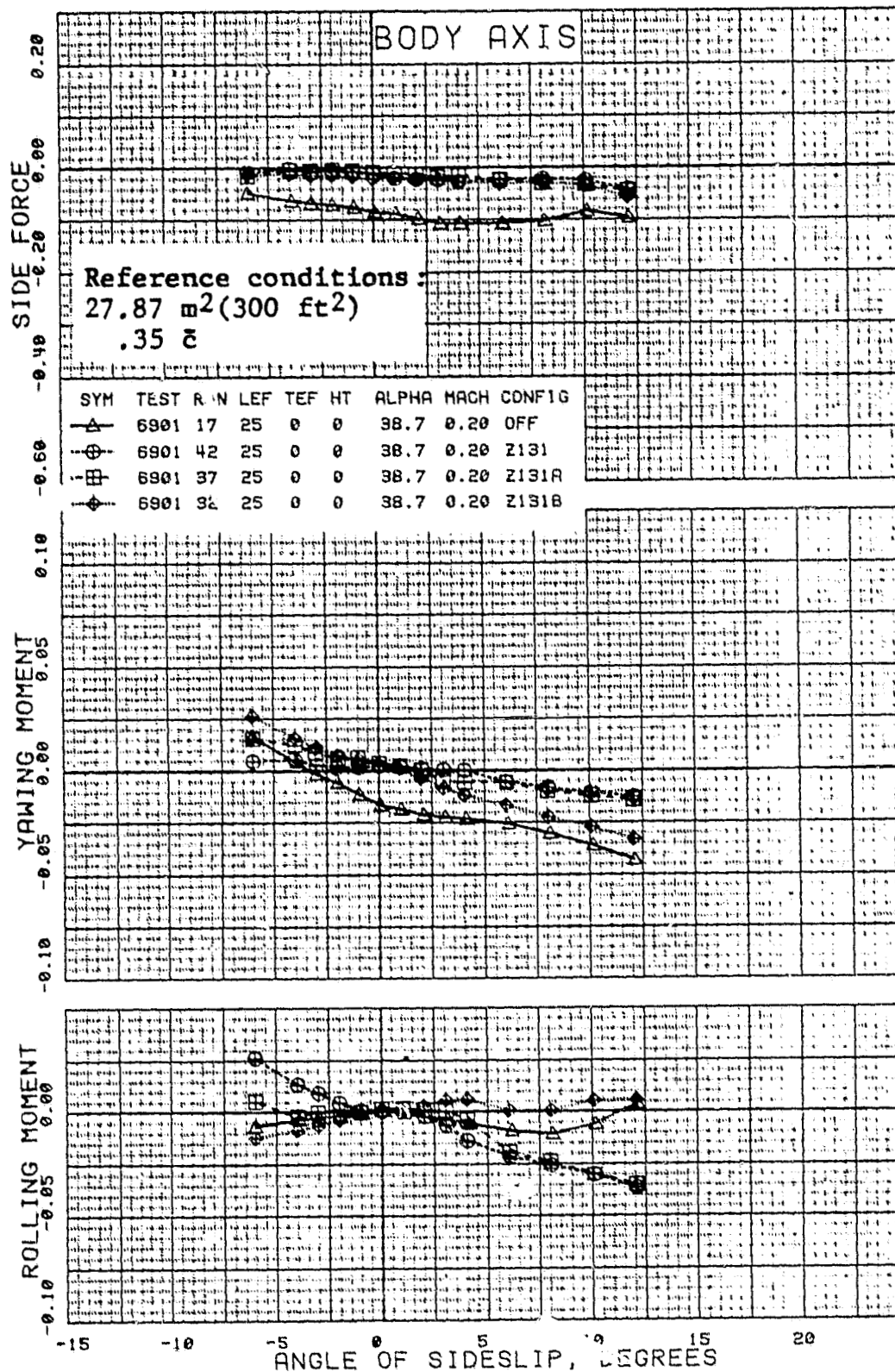


Figure 2-32 (g) Force and Moments, $\alpha = 39^\circ$

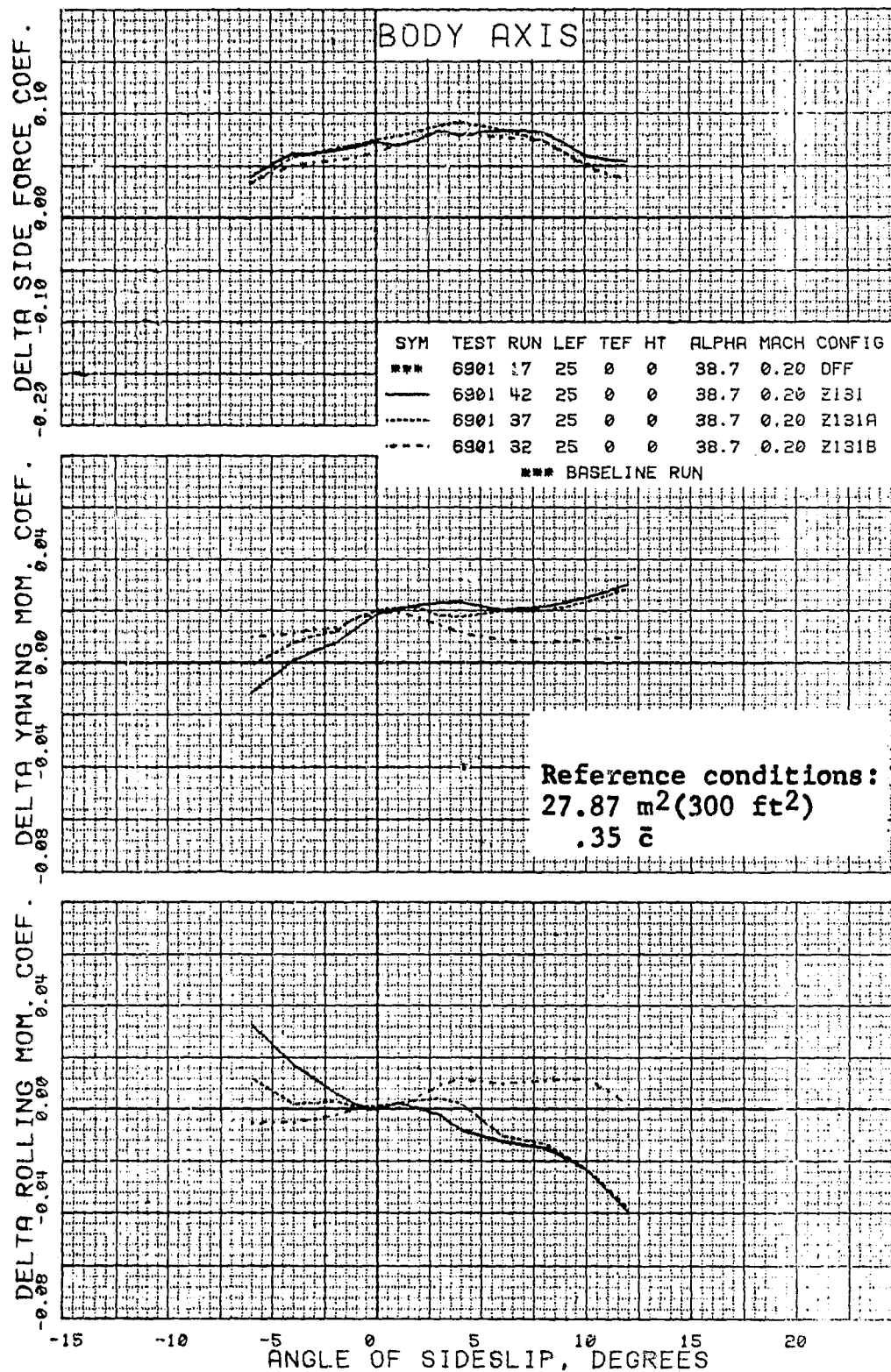


Figure 2-32 (h) Increments, $\alpha=39^\circ$

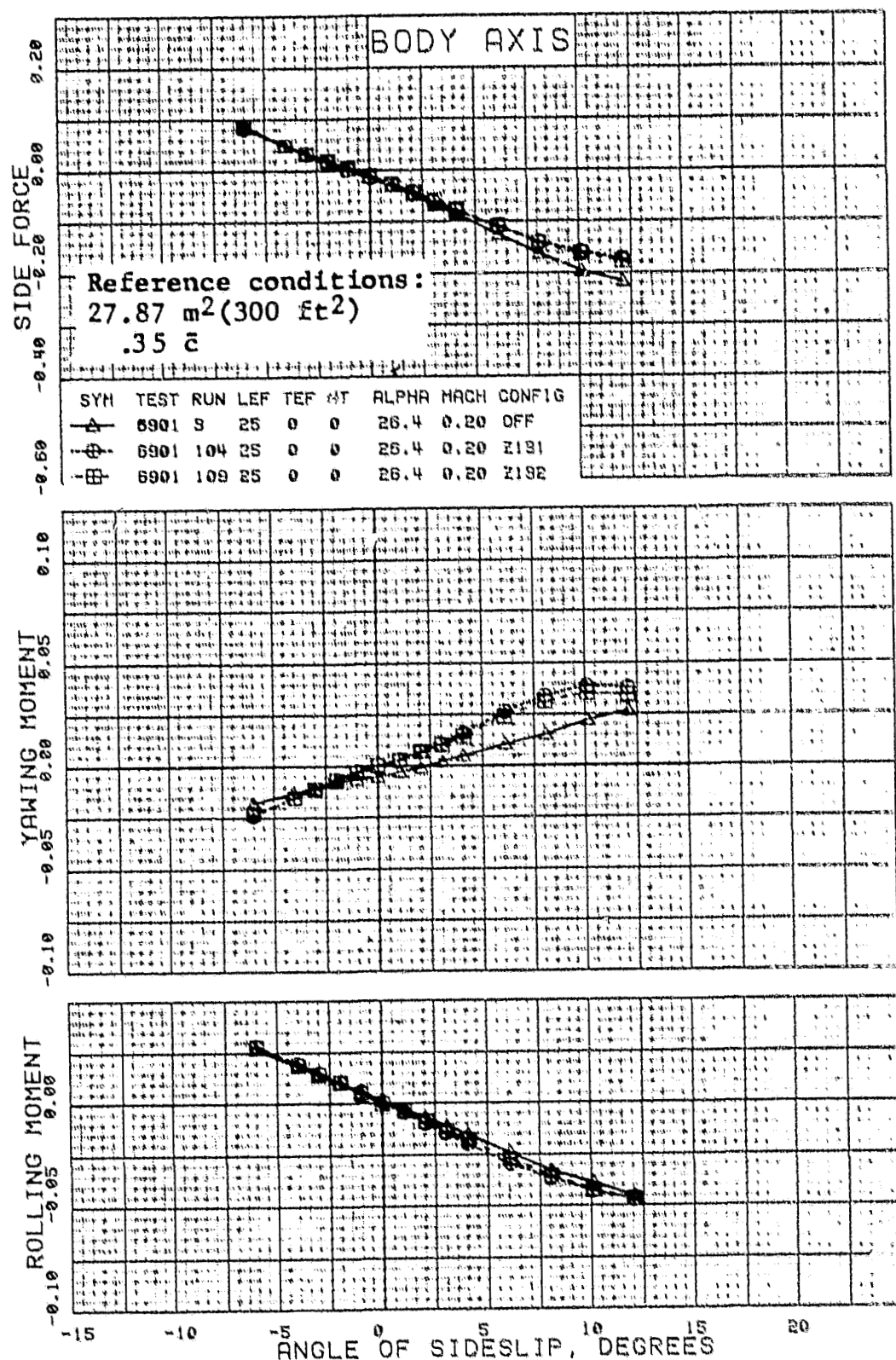


Figure 2-33 Effect of Nose Strakes Z131 and Z132, F-16
 (a) Force and Moments, $\alpha = 26^\circ$

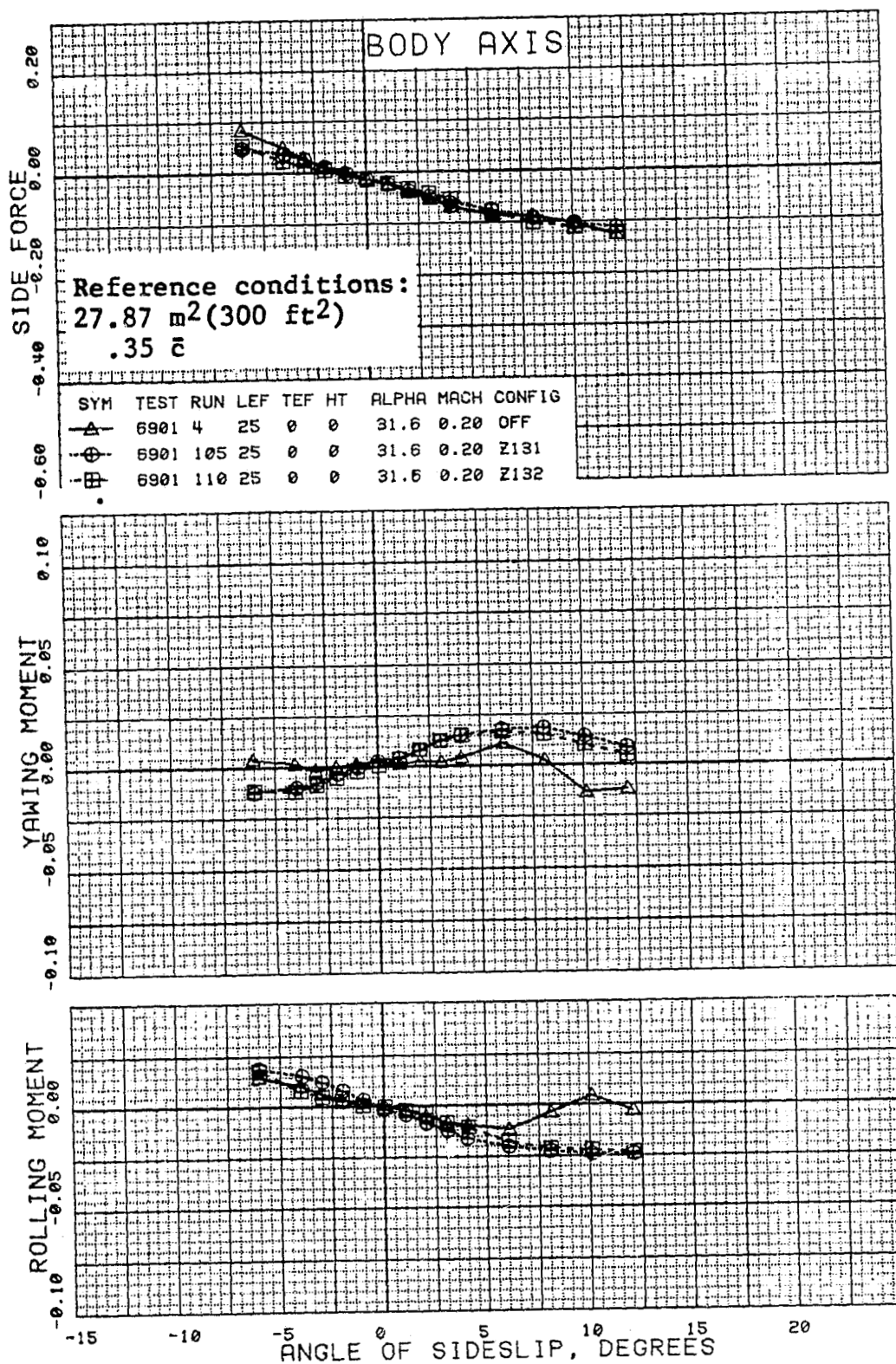


Figure 2-33 (b) Force and Moments, $\alpha = 32^\circ$

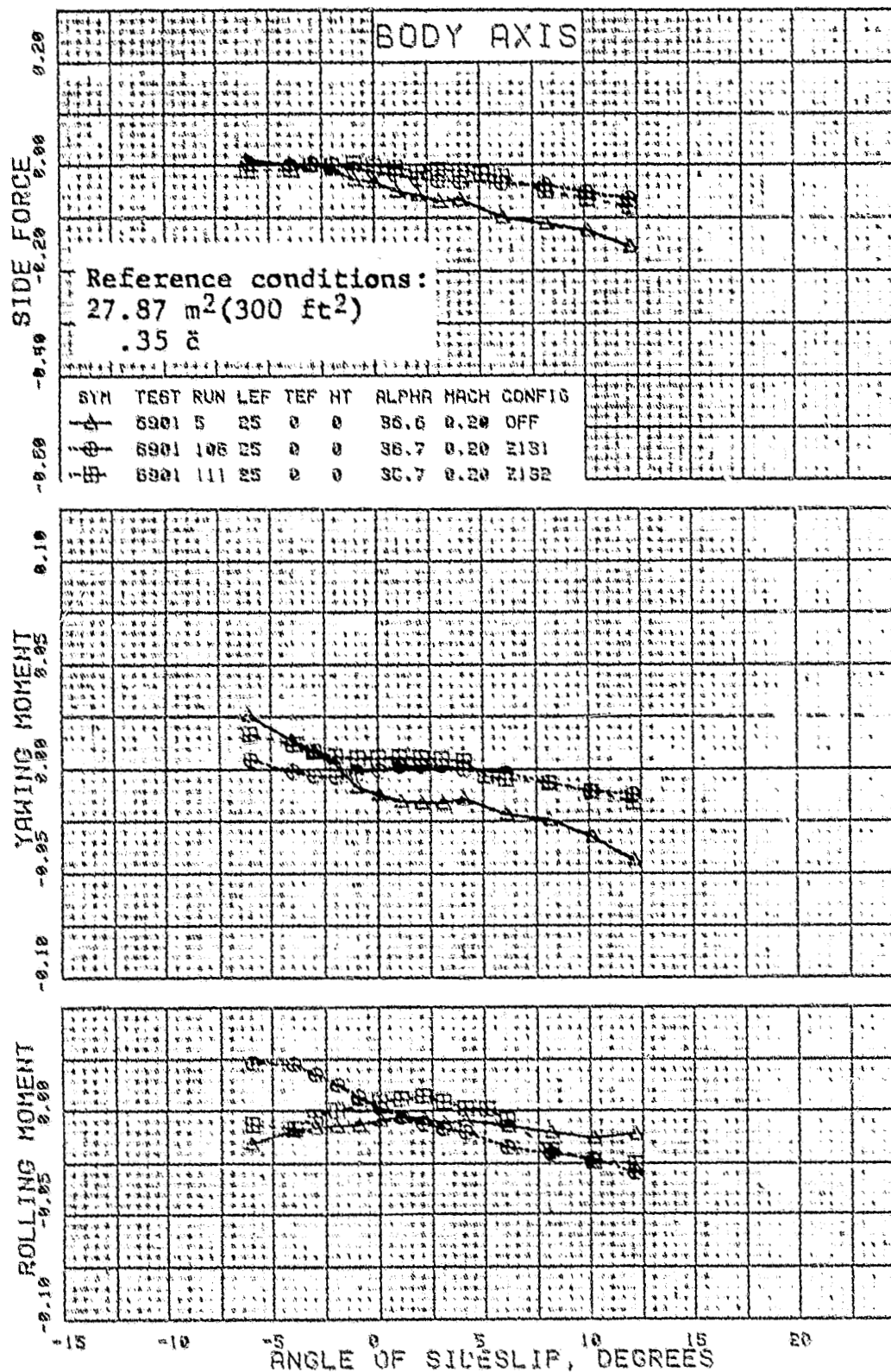


Figure 2-33 (c) Force and Moments, $\alpha = 37^\circ$

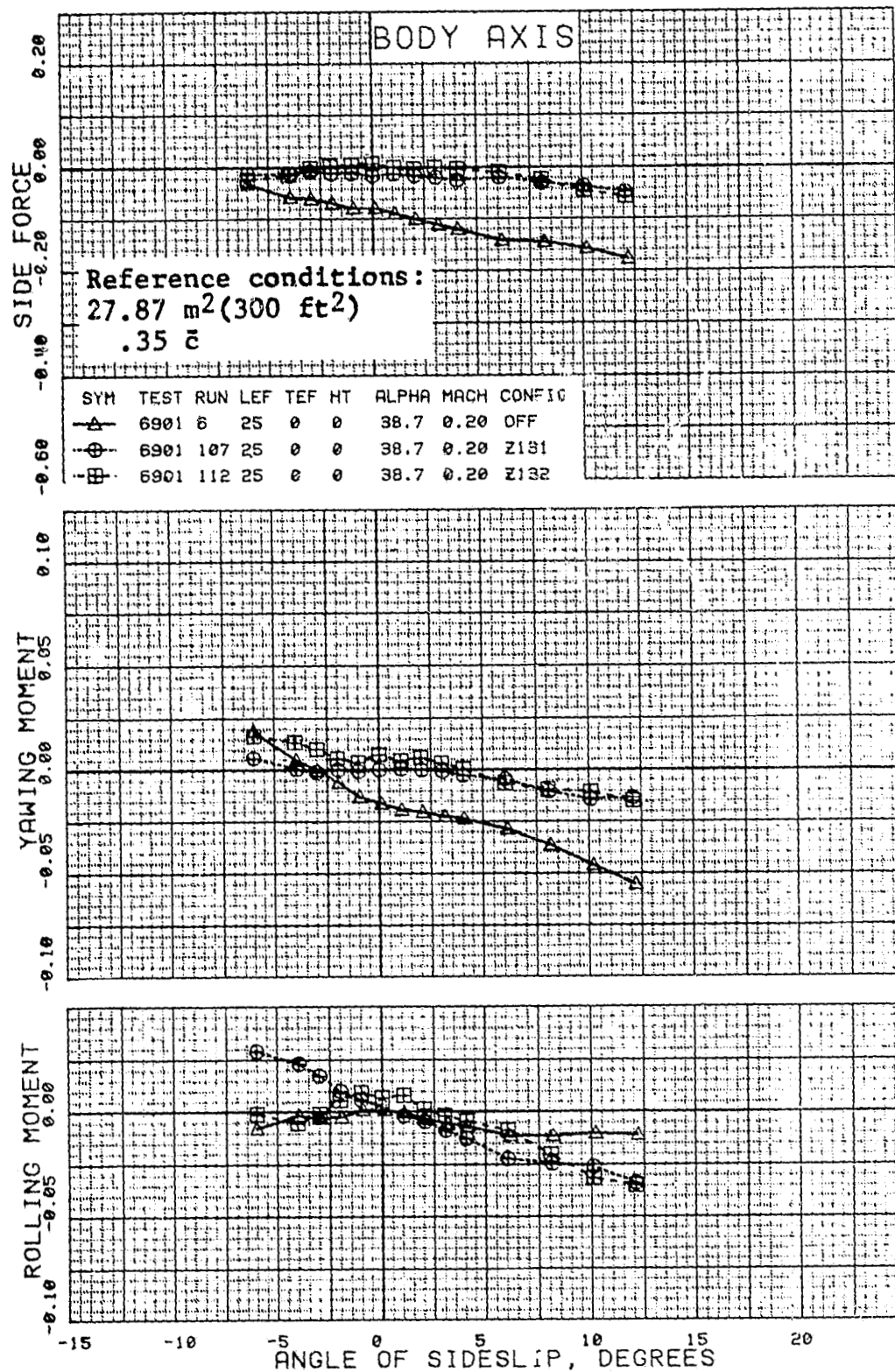


Figure 2-33 (d) Force and Moments, $\alpha=39^\circ$

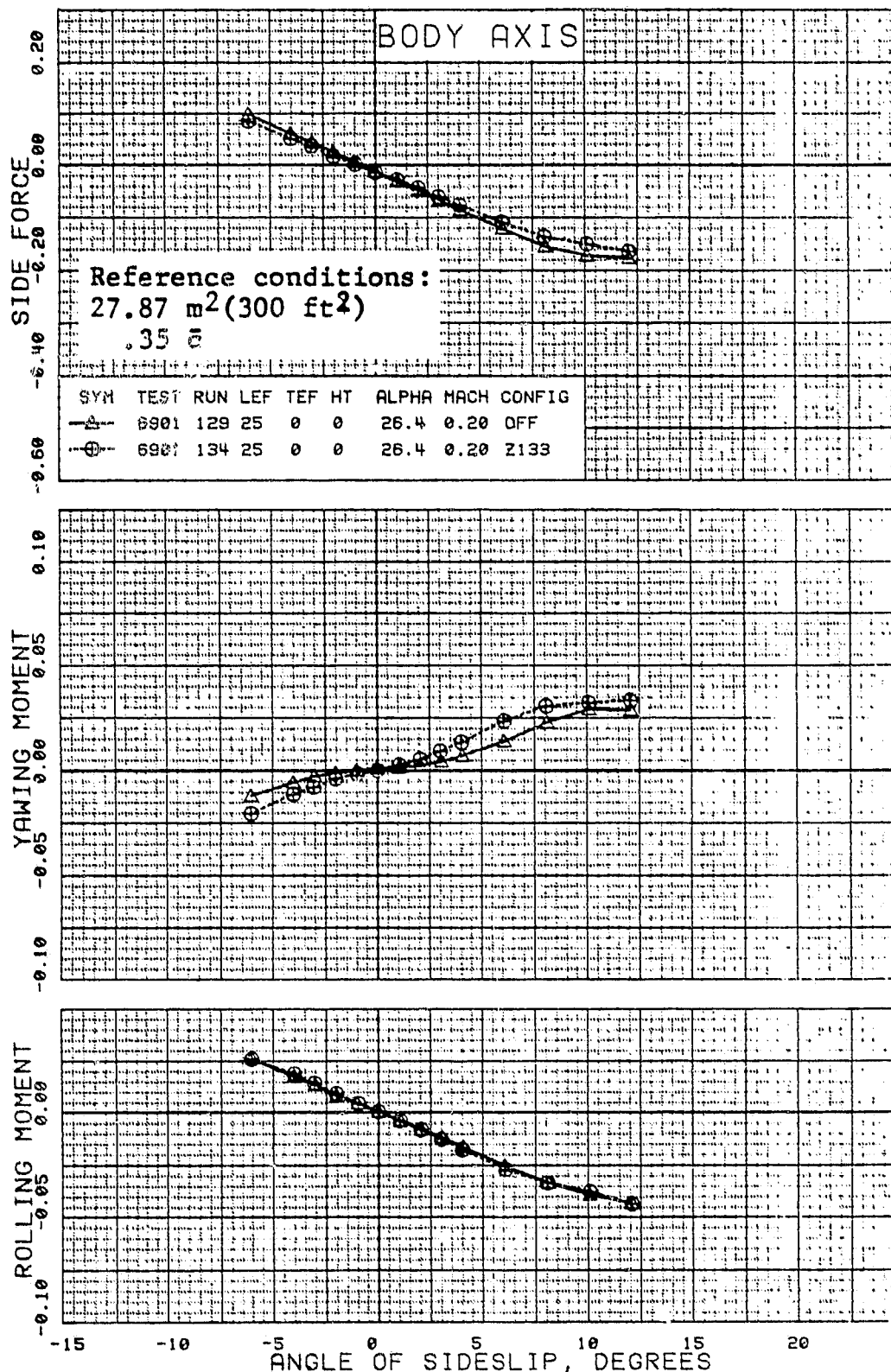


Figure 2-34 Effect of Nose Strake Z133, F-16
 (a) Force and Moments, $\alpha = 26^\circ$

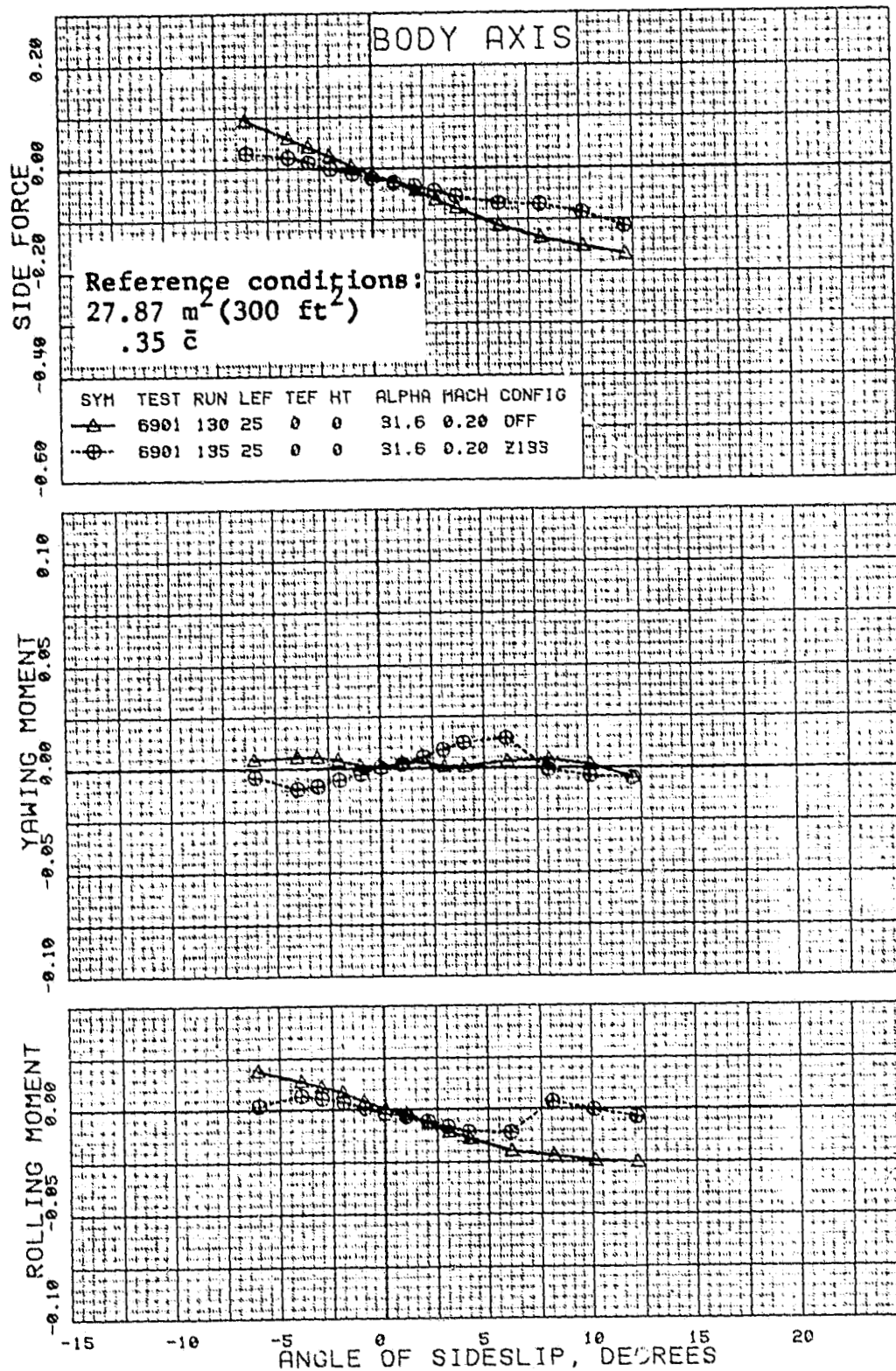


Figure 2-34 (b) Force and Moments, $\alpha=32^\circ$

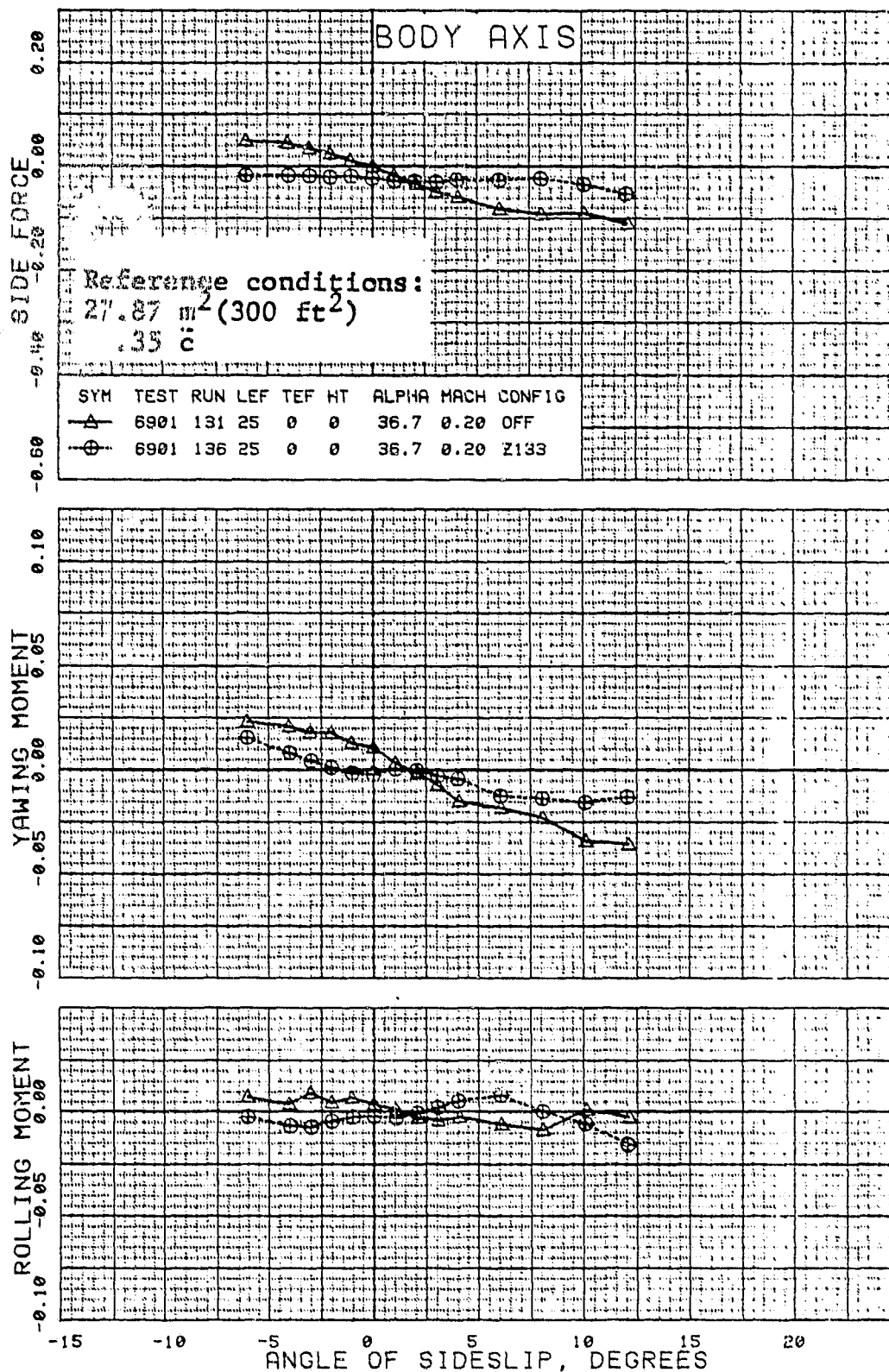


Figure 2-34 (c) Force and Moments, $\alpha=37^\circ$

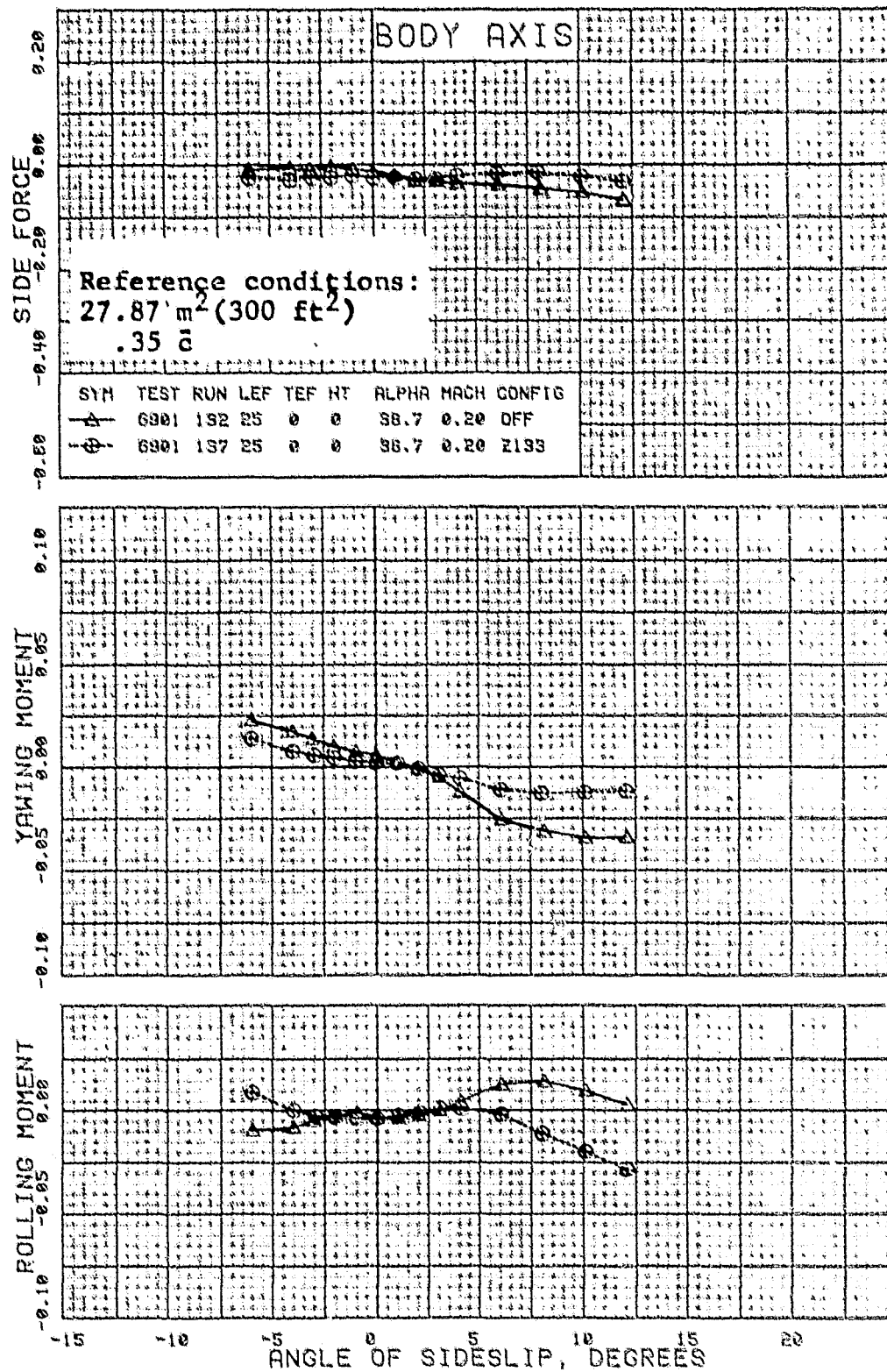


Figure 2-34 (d) Force and Moments, $\alpha = 39^\circ$

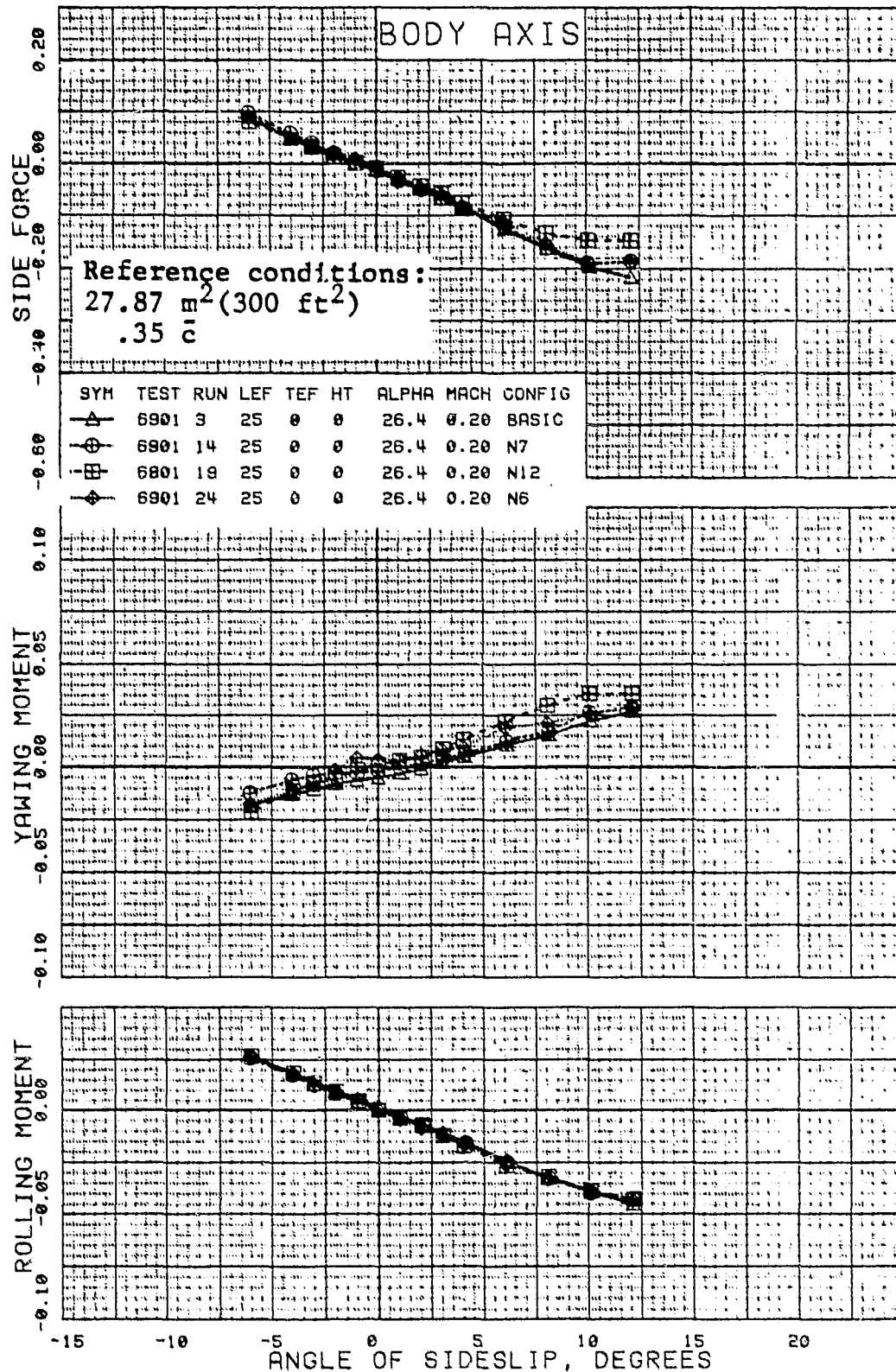


Figure 2-35 Effect of Nose Shape, F-16
(a) Force and Moments, $\alpha = 26^\circ$

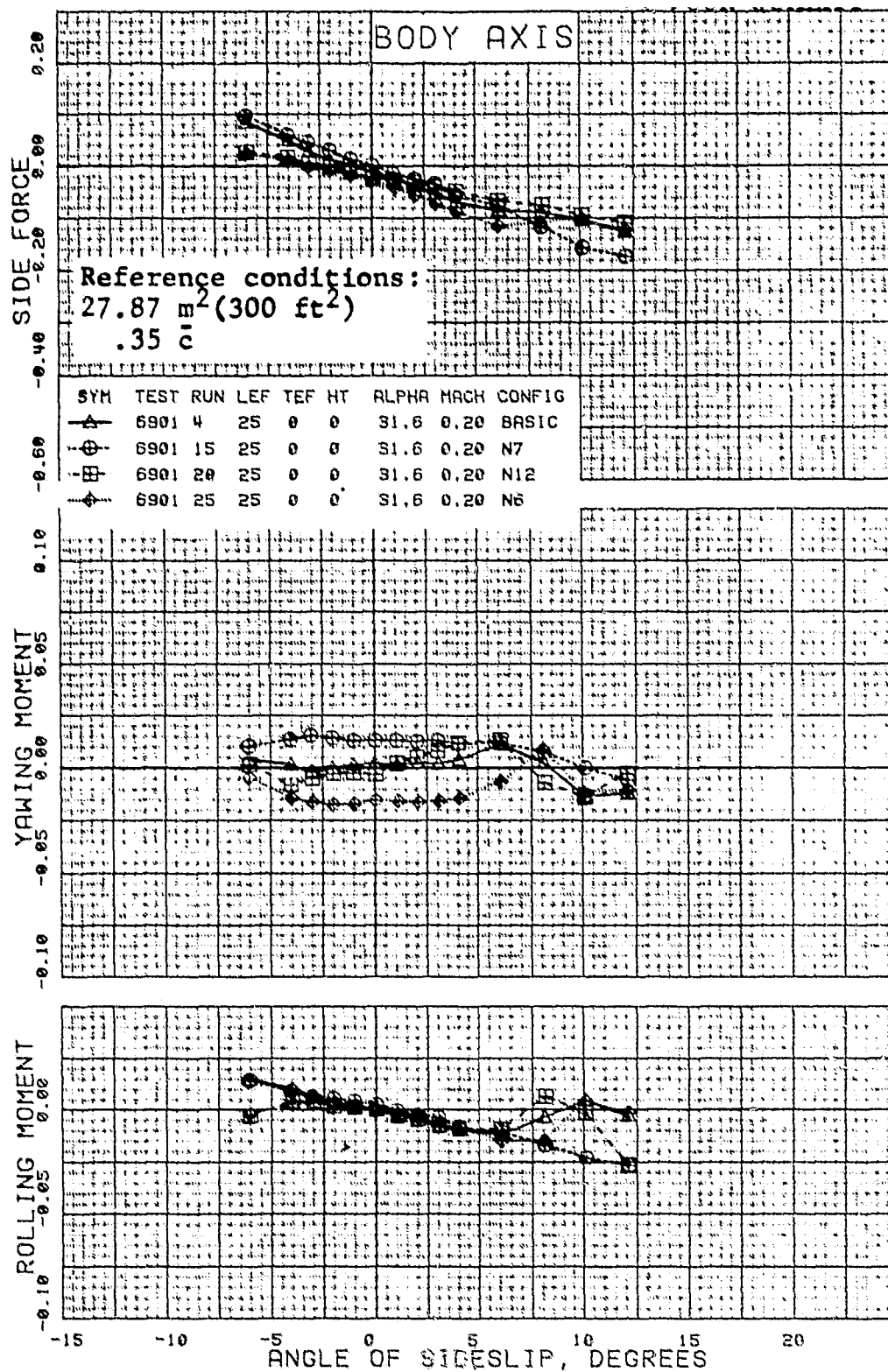


Figure 2-35 (b) Force and Moments, $\alpha = 32^\circ$

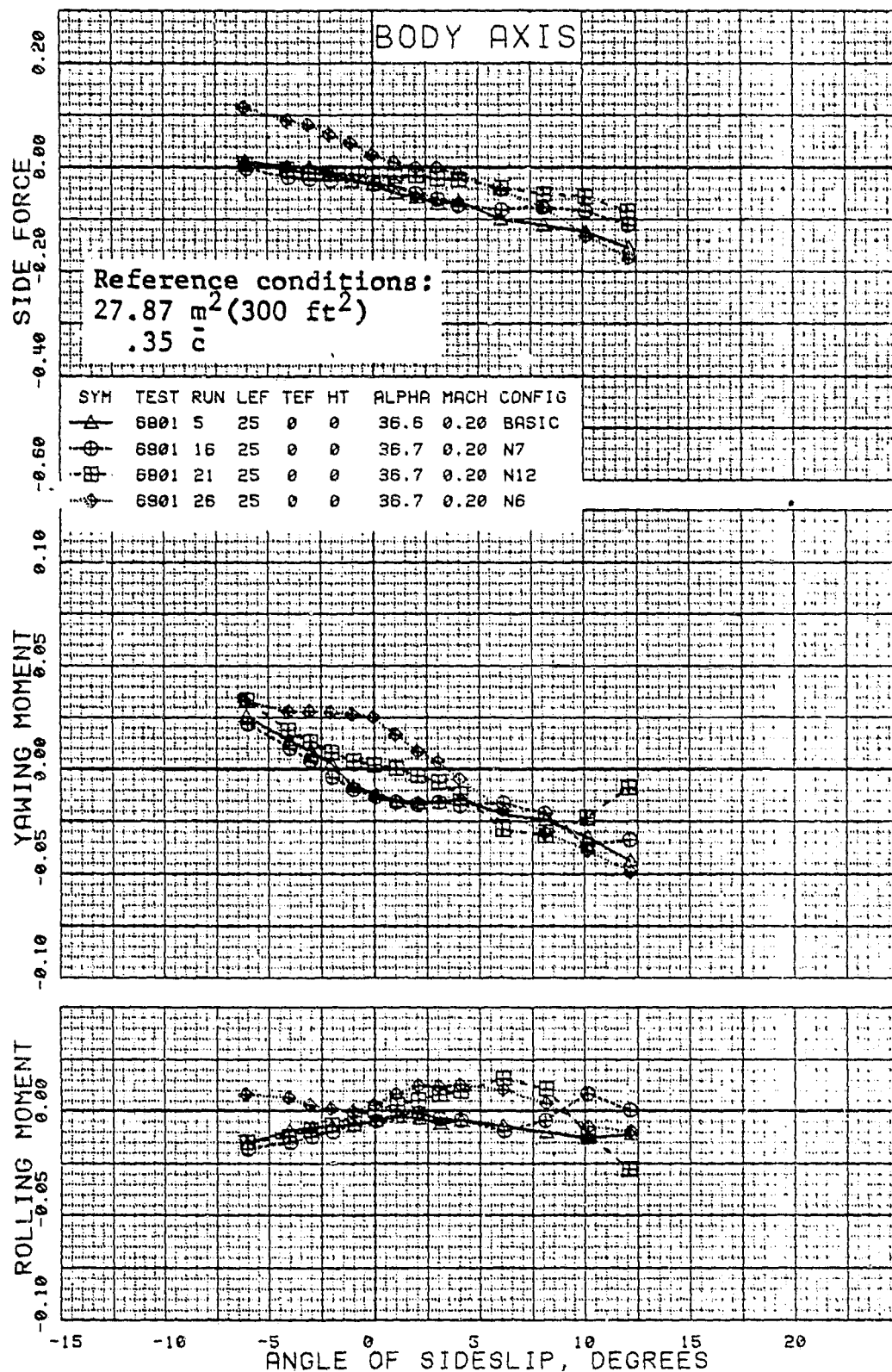


Figure 2-35 (c) Force and Moments, $\alpha = 37^\circ$

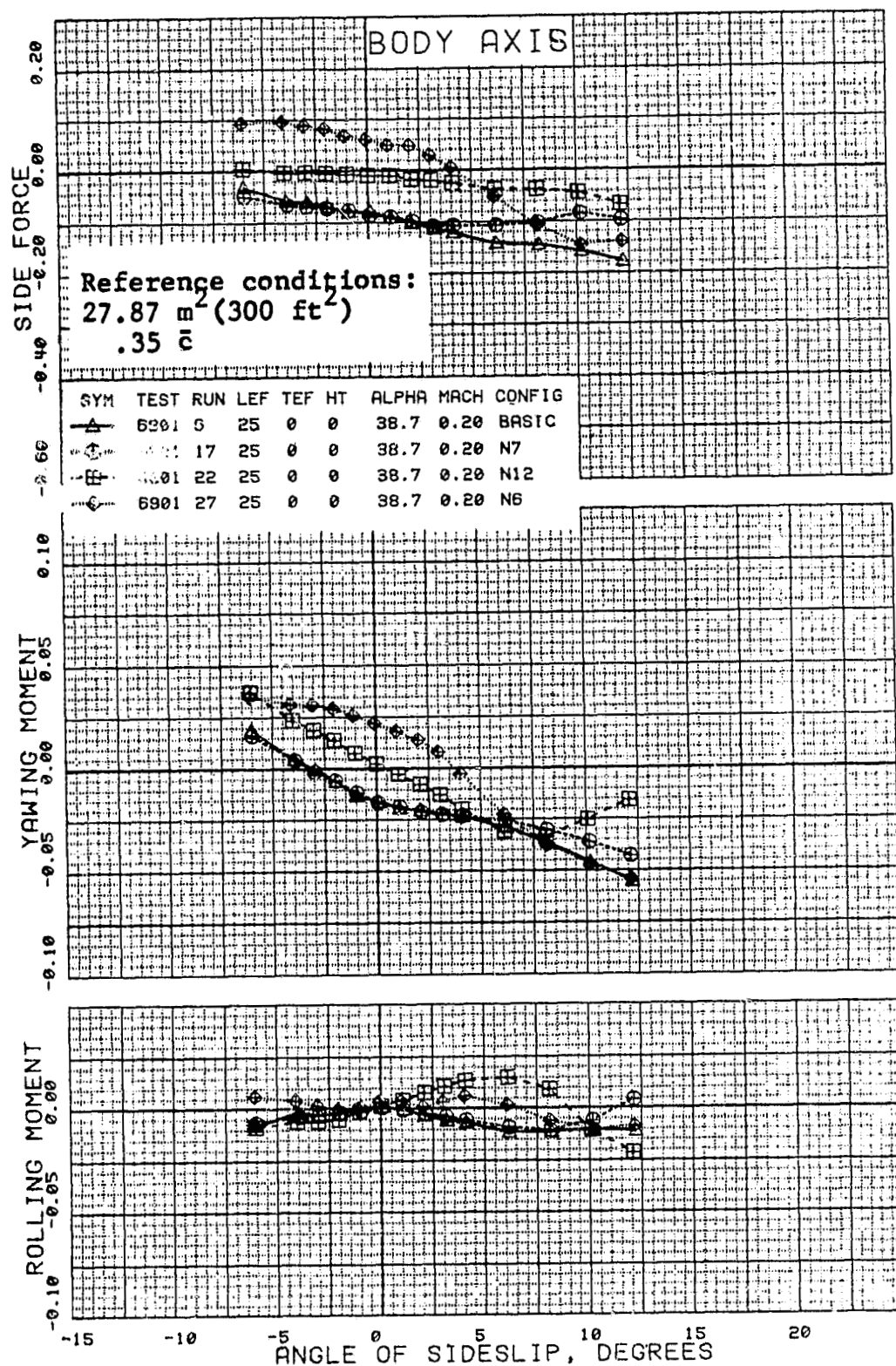


Figure 2-35 (d) Force and Moments, $\alpha = 39^\circ$

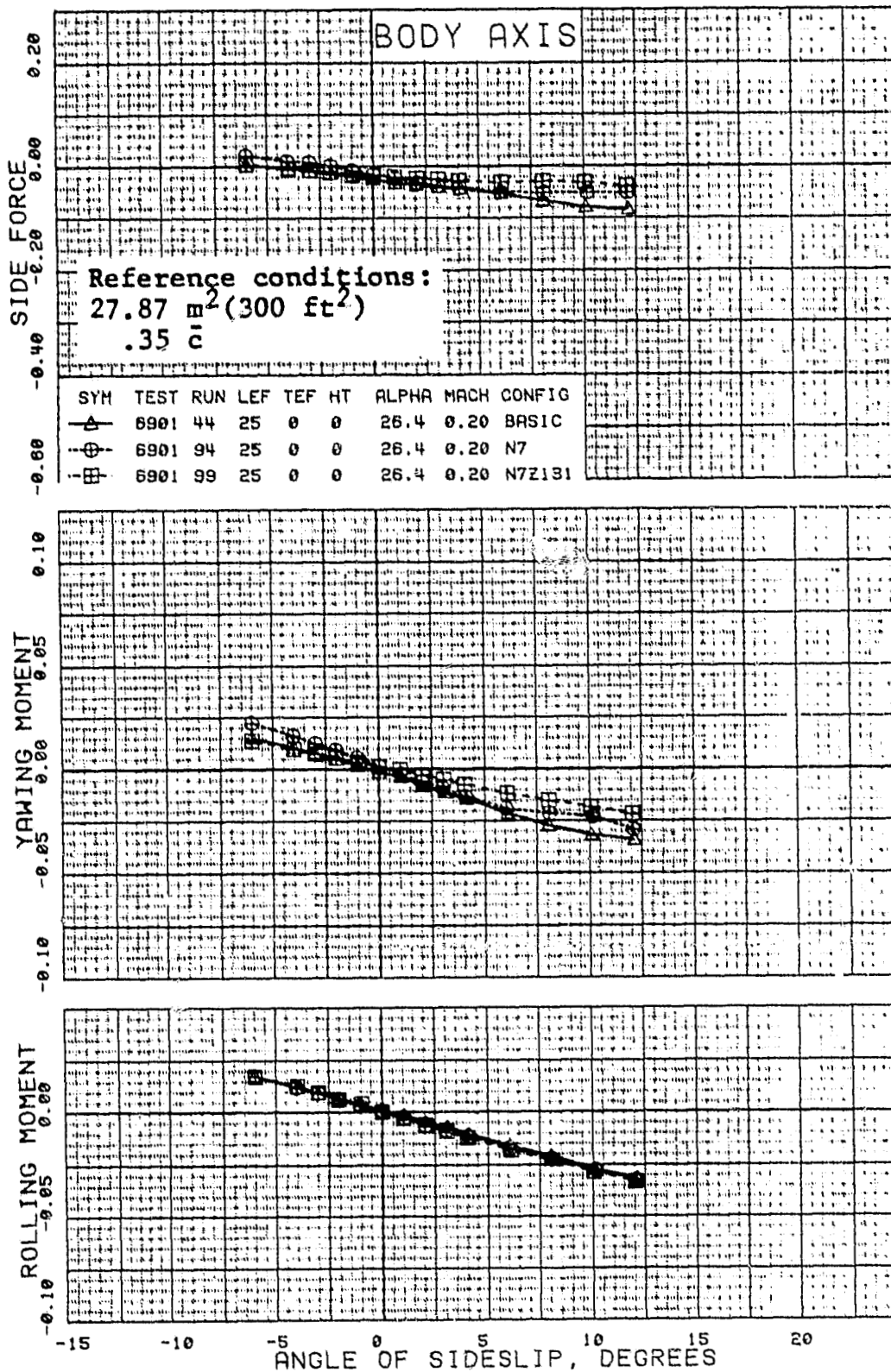


Figure 2-36 Effect of Nose Strake Z131 with Nose N7 and Vertical Tail Off, F-16
 (a) Force and Moments, $\alpha=26^\circ$

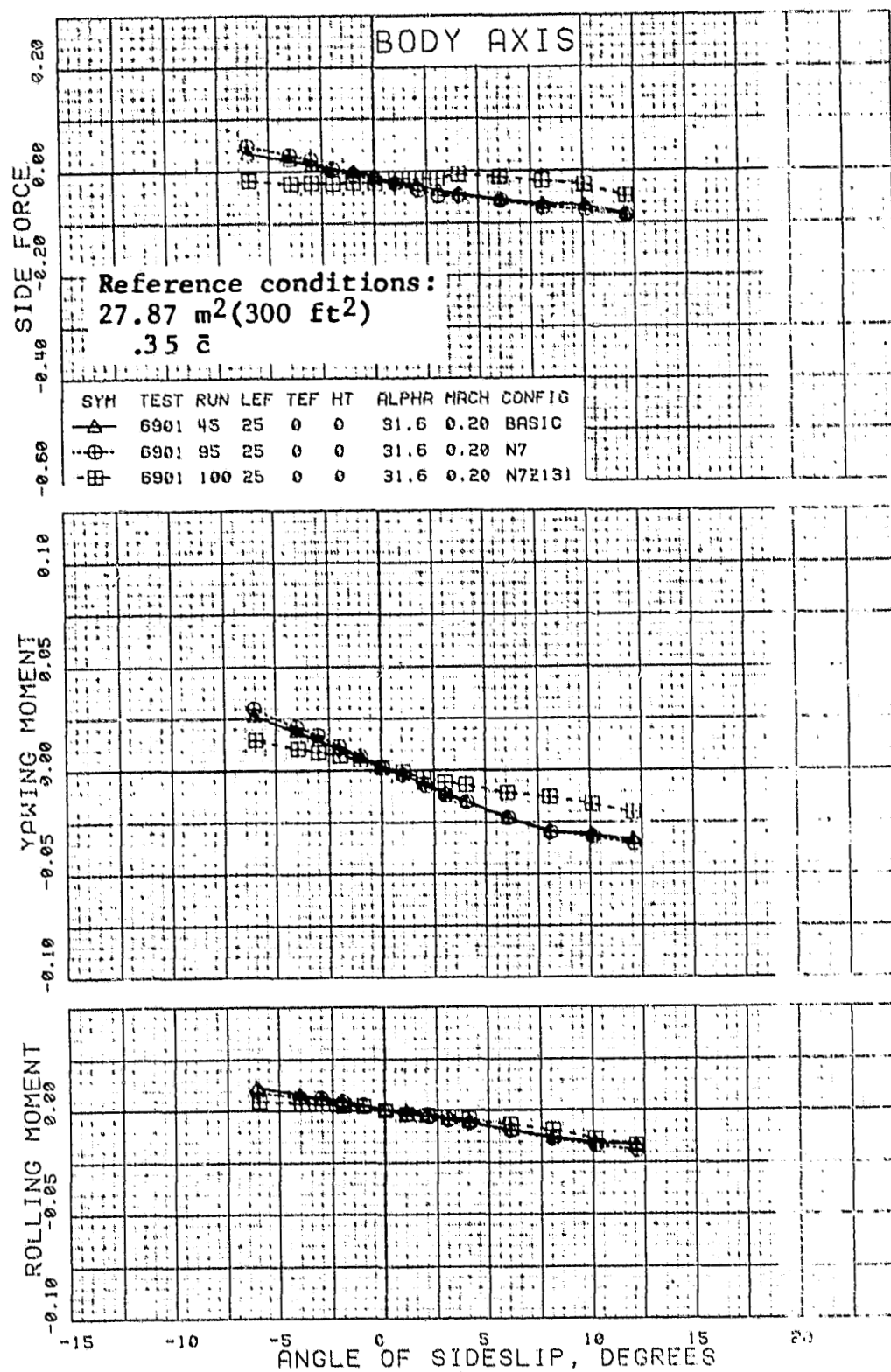


Figure 2-36 (b) Force and Moments, $\alpha=32^\circ$

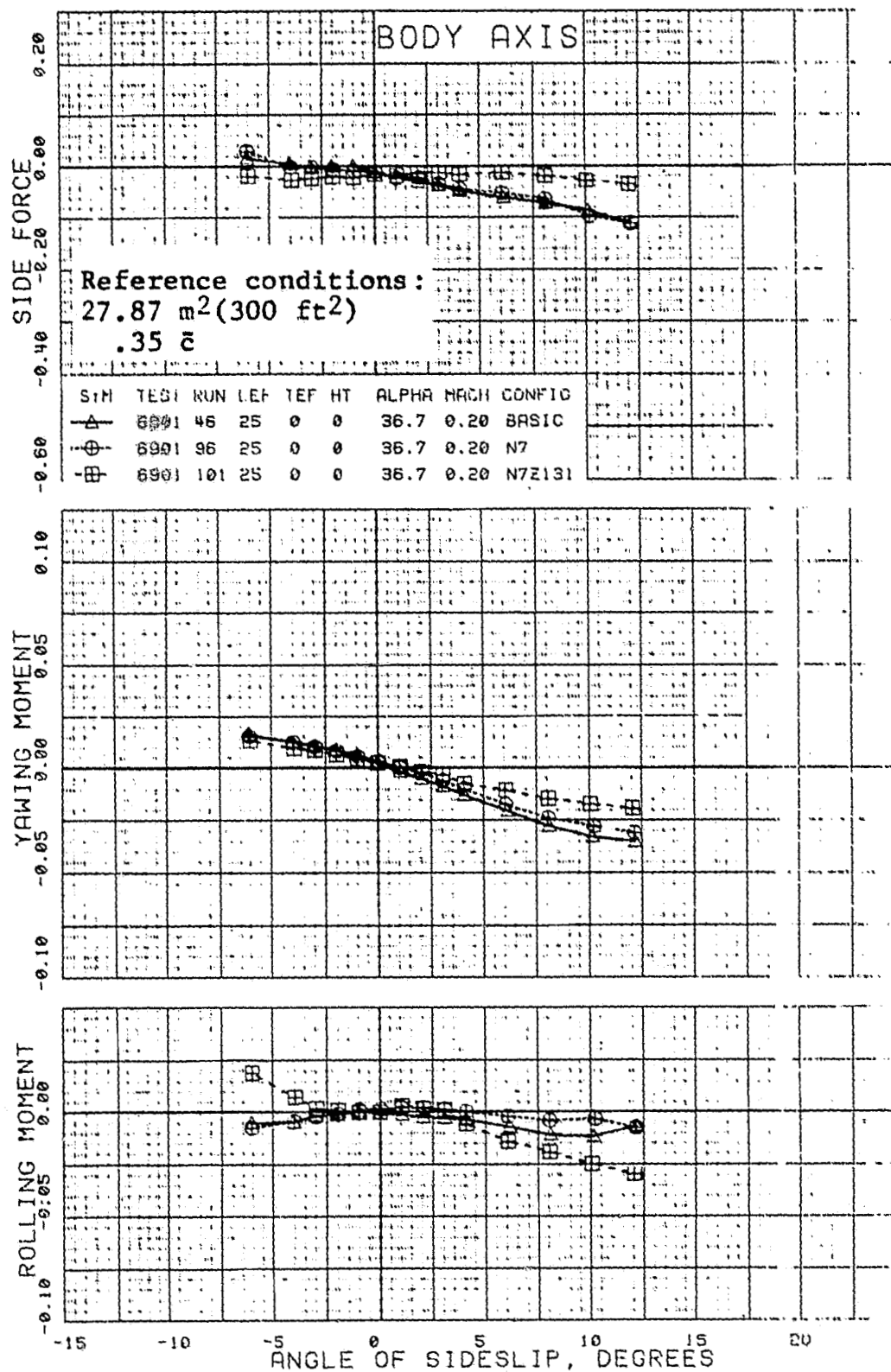


Figure 2-36 (c) Force and Moments, $\alpha = 37^\circ$

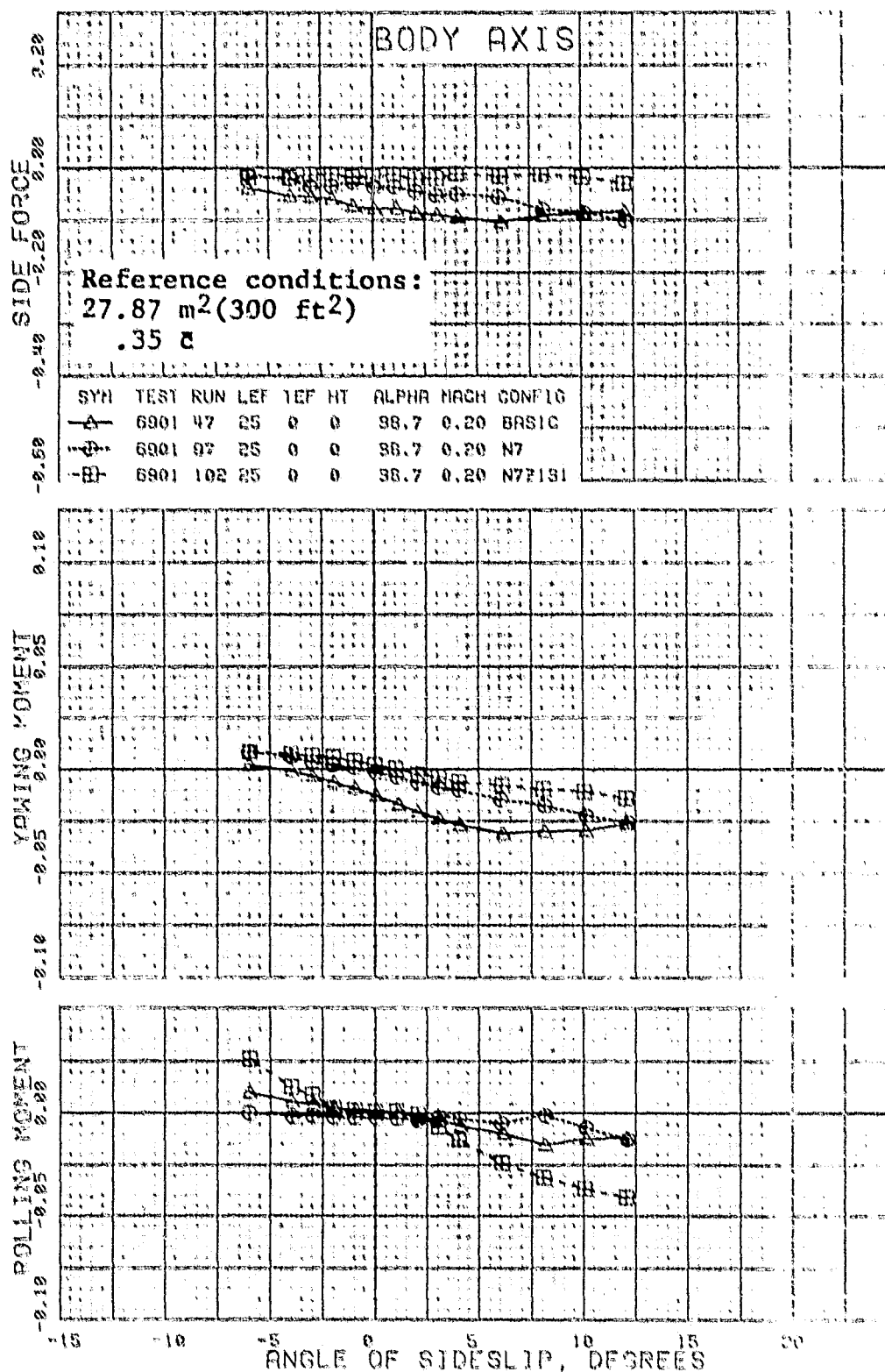


Figure 2-36 (d) Force and Moments, $\alpha=39^\circ$

3. TRANSONIC PITCH DATA

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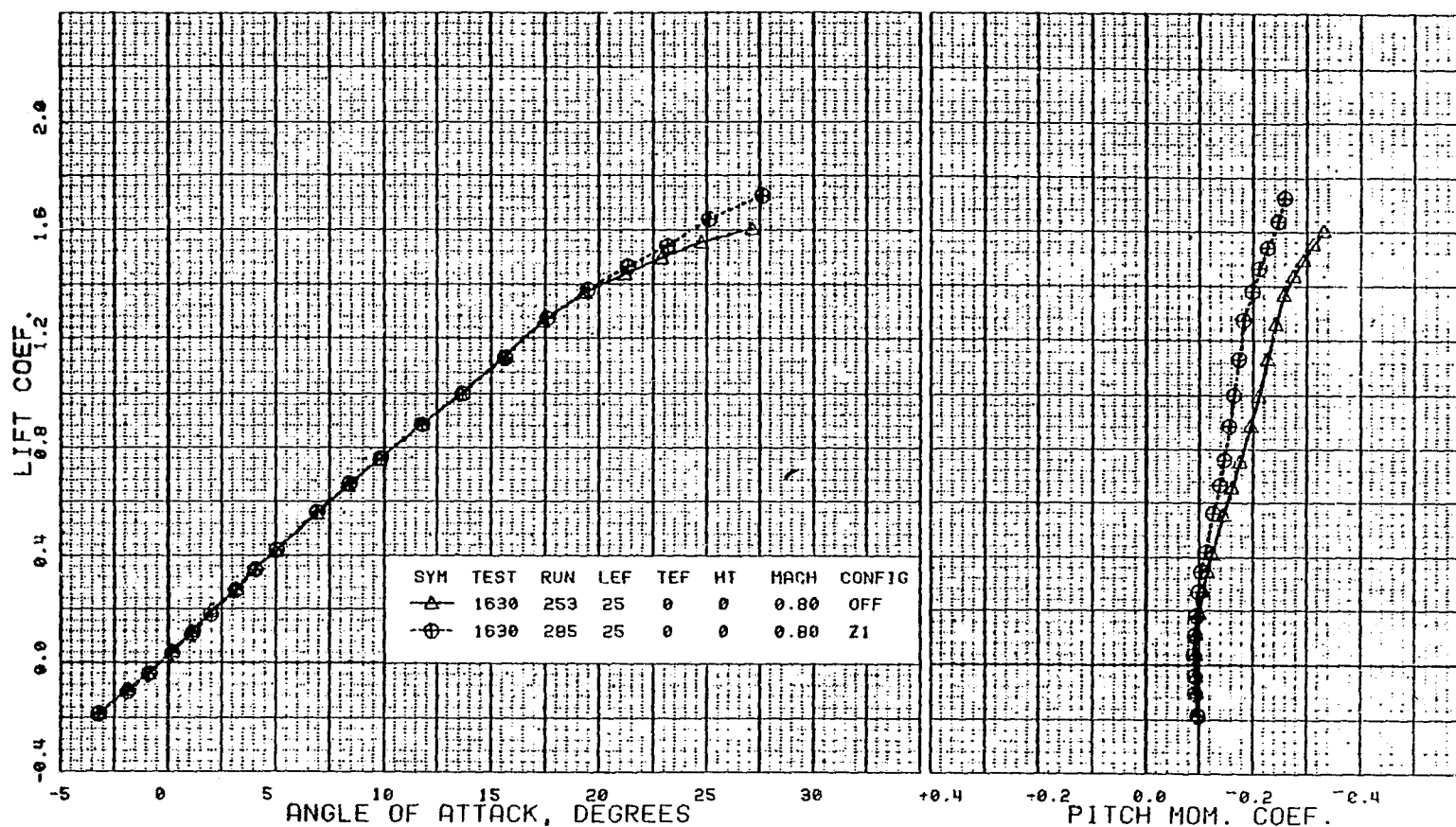
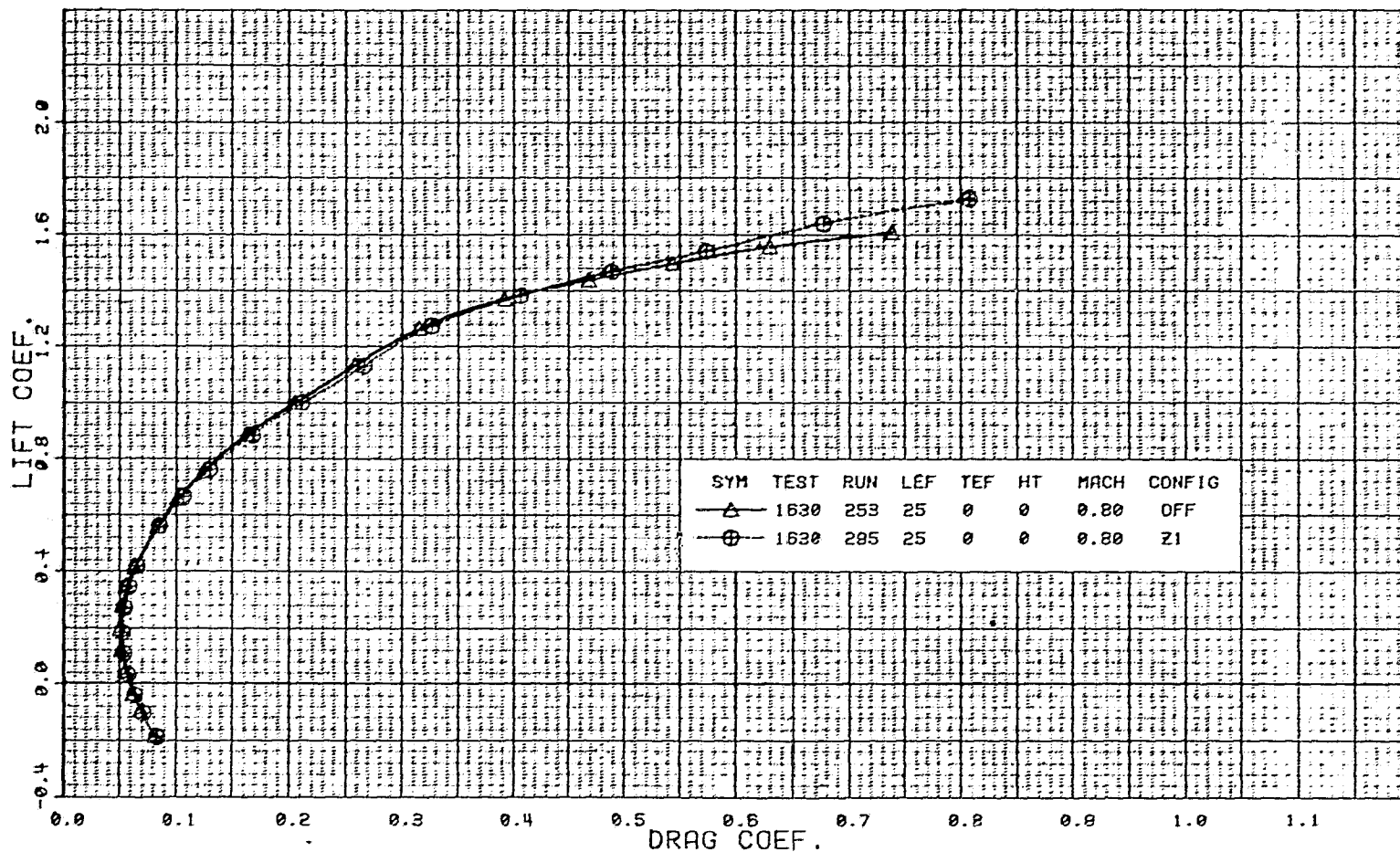


Figure 3-1 Effect of Canard Stroke Z1, Configuration 401F-2 with Twin Vertical Tails, $M = 0.80$
(a) Lift and Pitching Moment



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Figure 3-1 (b) Drag, Large Scale

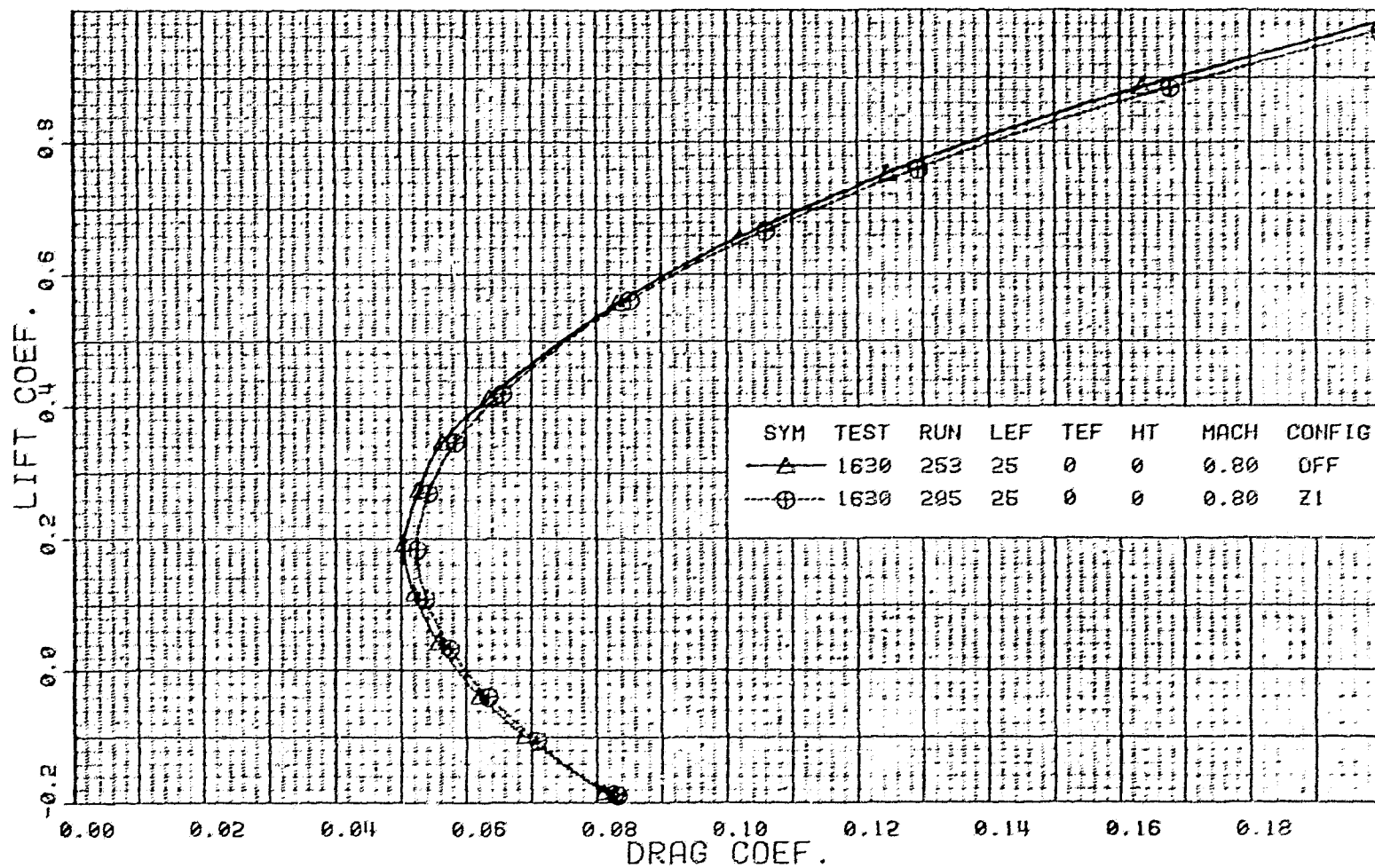


Figure 3-1 (c) Drag, Small Scale

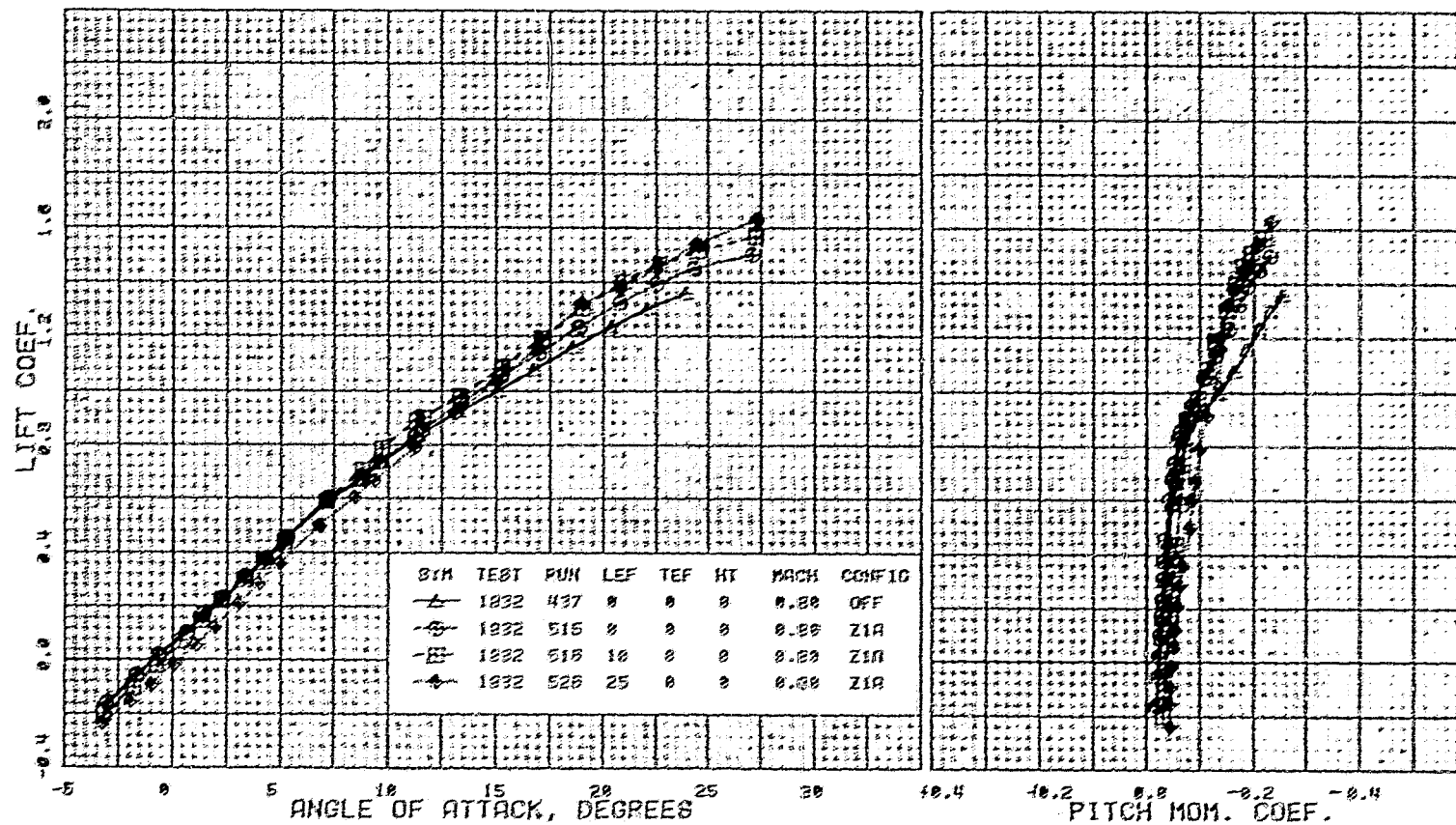


Figure 3-2 Effect of Leading Edge Flap Deflection with Canard Strake
 Z1A, Configuration 401F-5, $M = 0.80$
 (a) Lift and Pitching Moment

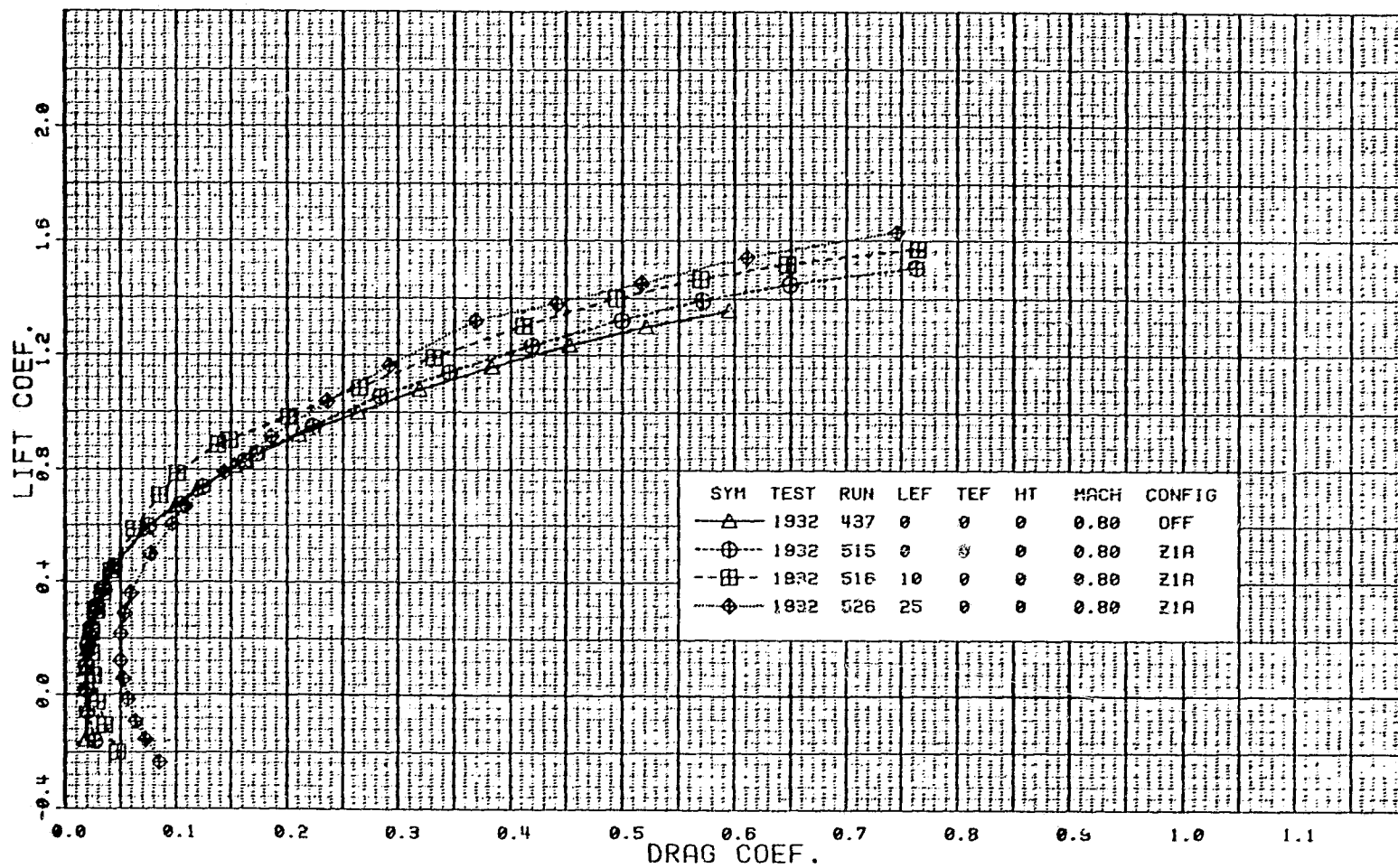


Figure 3-2 (b) Drag, Large Scale

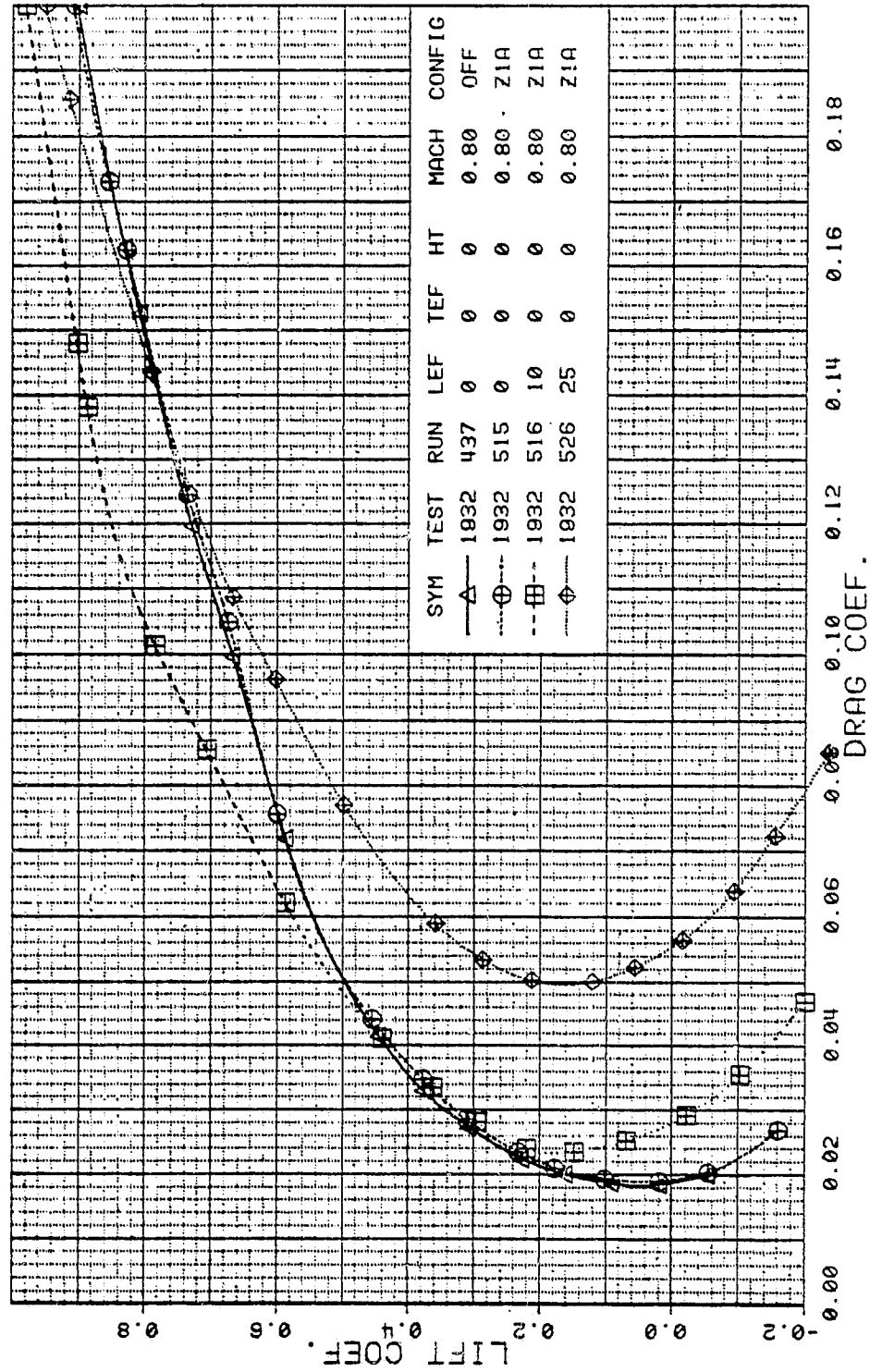


Figure 3-2 (c) Drag, Small Scale

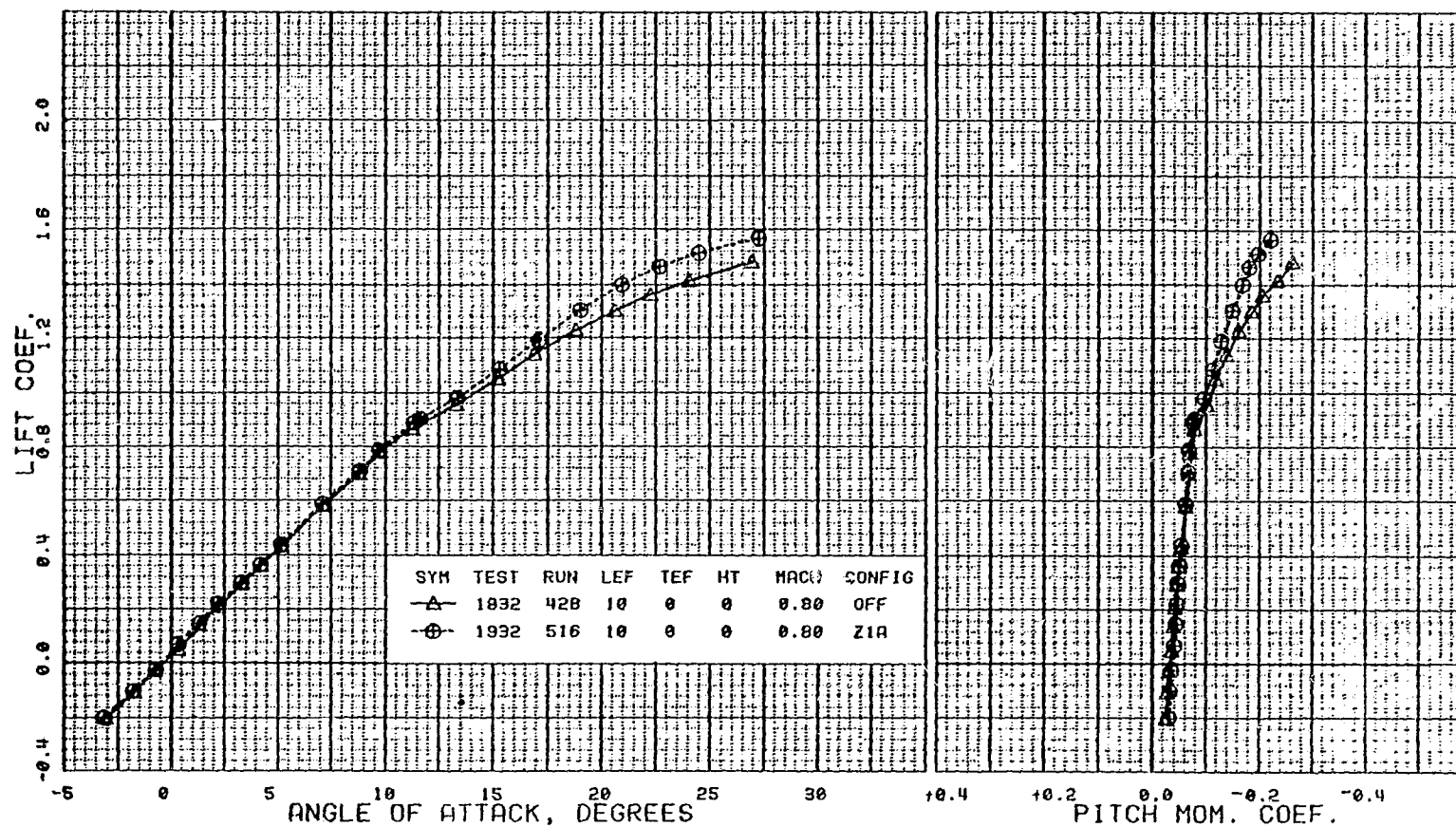


Figure 3-3 Effect of Canard Strake Z1A, Configuration 401F-5, LEF = 10°,
M = 0.80
(a) Lift and Pitching Moment

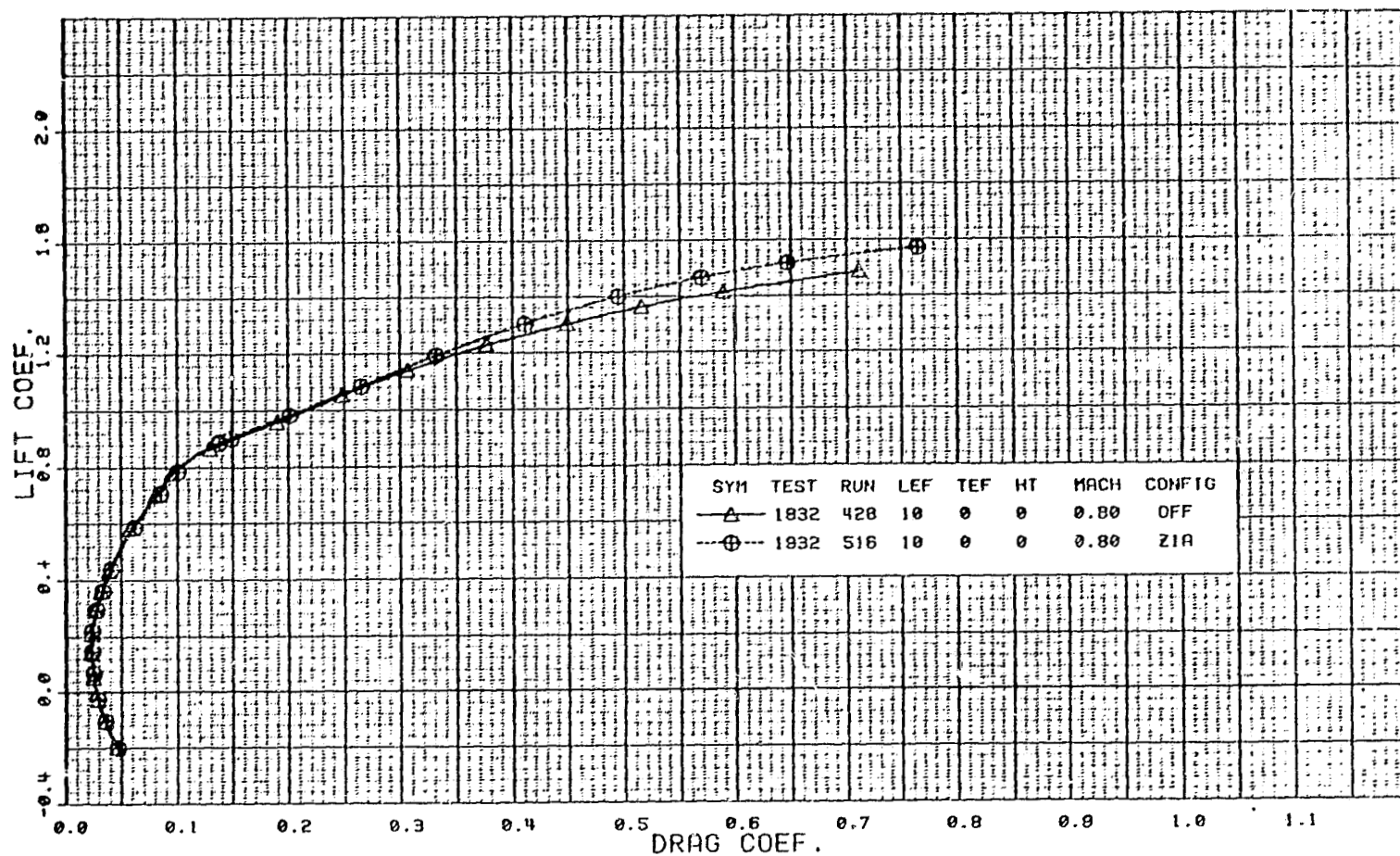


Figure 3-3 (b) Drag, Large Scale

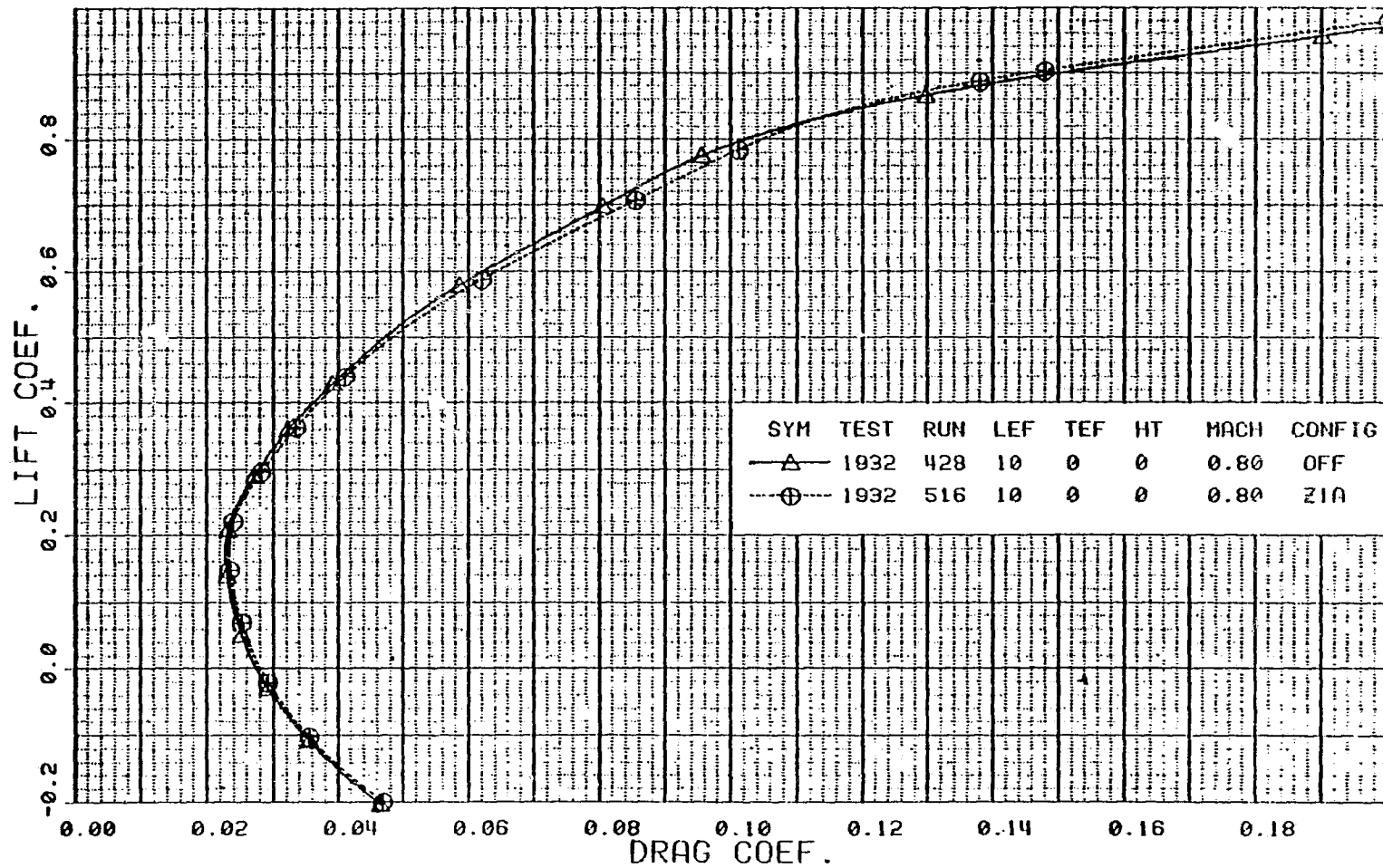


Figure 3-3 (c) Drag, Small Scale

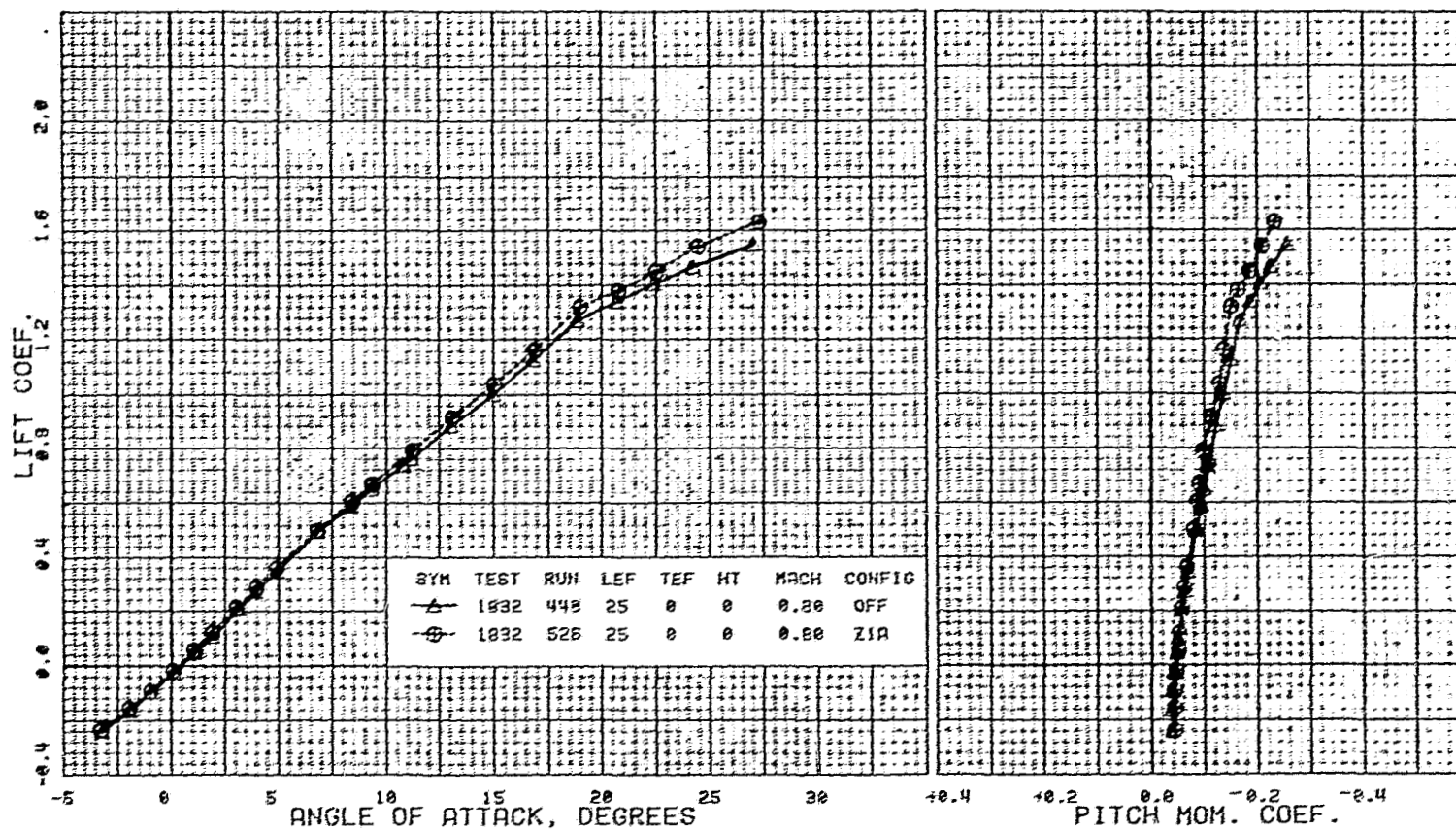


Figure 3-4 Effect of Canard Strake Z1A, Configuration 401F-5, LEF = 25°, M = 0.80
(a) Lift and Pitching Moment

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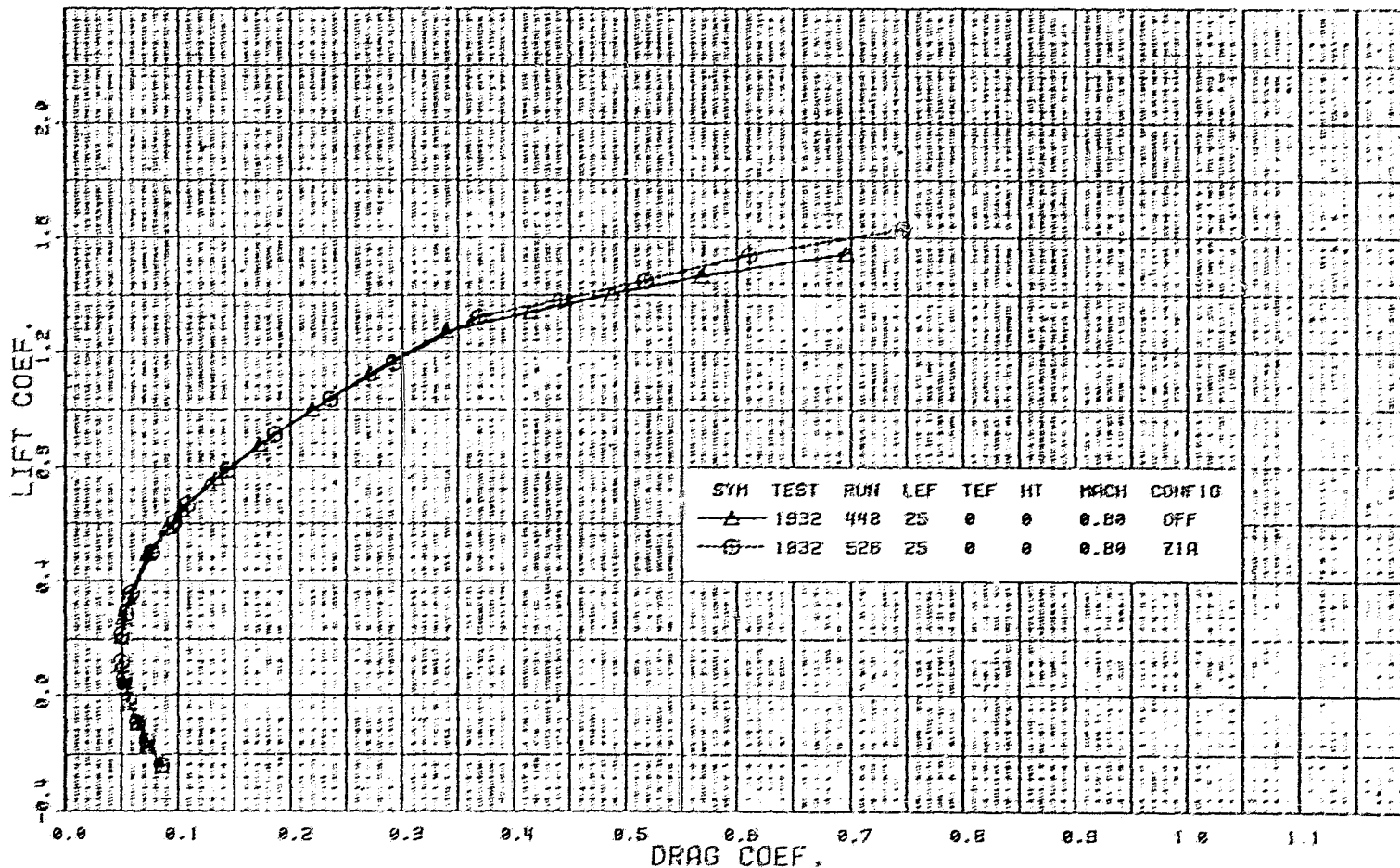


Figure 3-4 (b) Drag, Large Scale

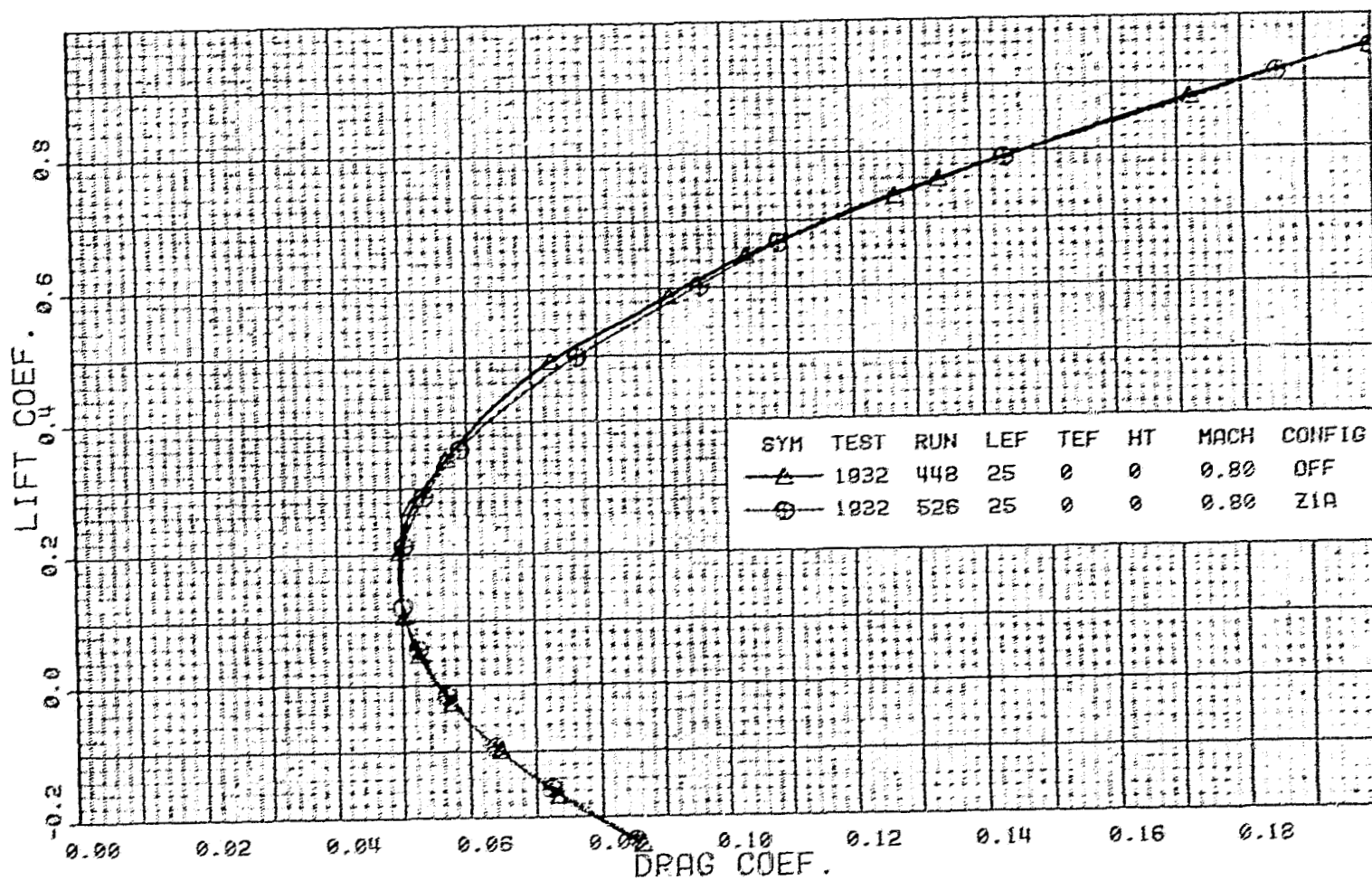


Figure 3-4 (c) Drag, Small Scale

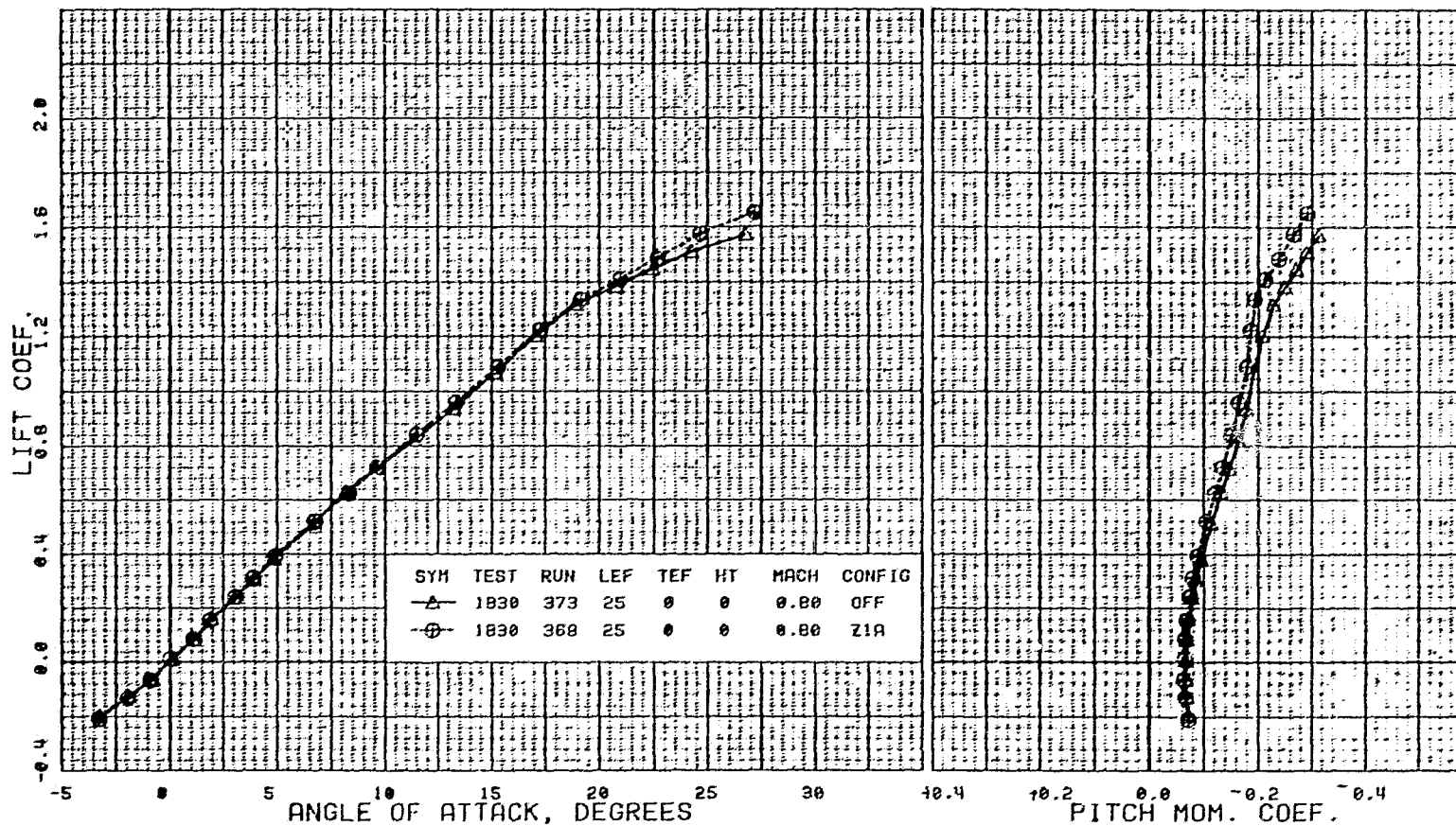


Figure 3-5 Effect of Canard Strake Z1A, Configuration 401F-2 with Twin Vertical Tails, M = 0.80
(a) Lift and Pitching Moment

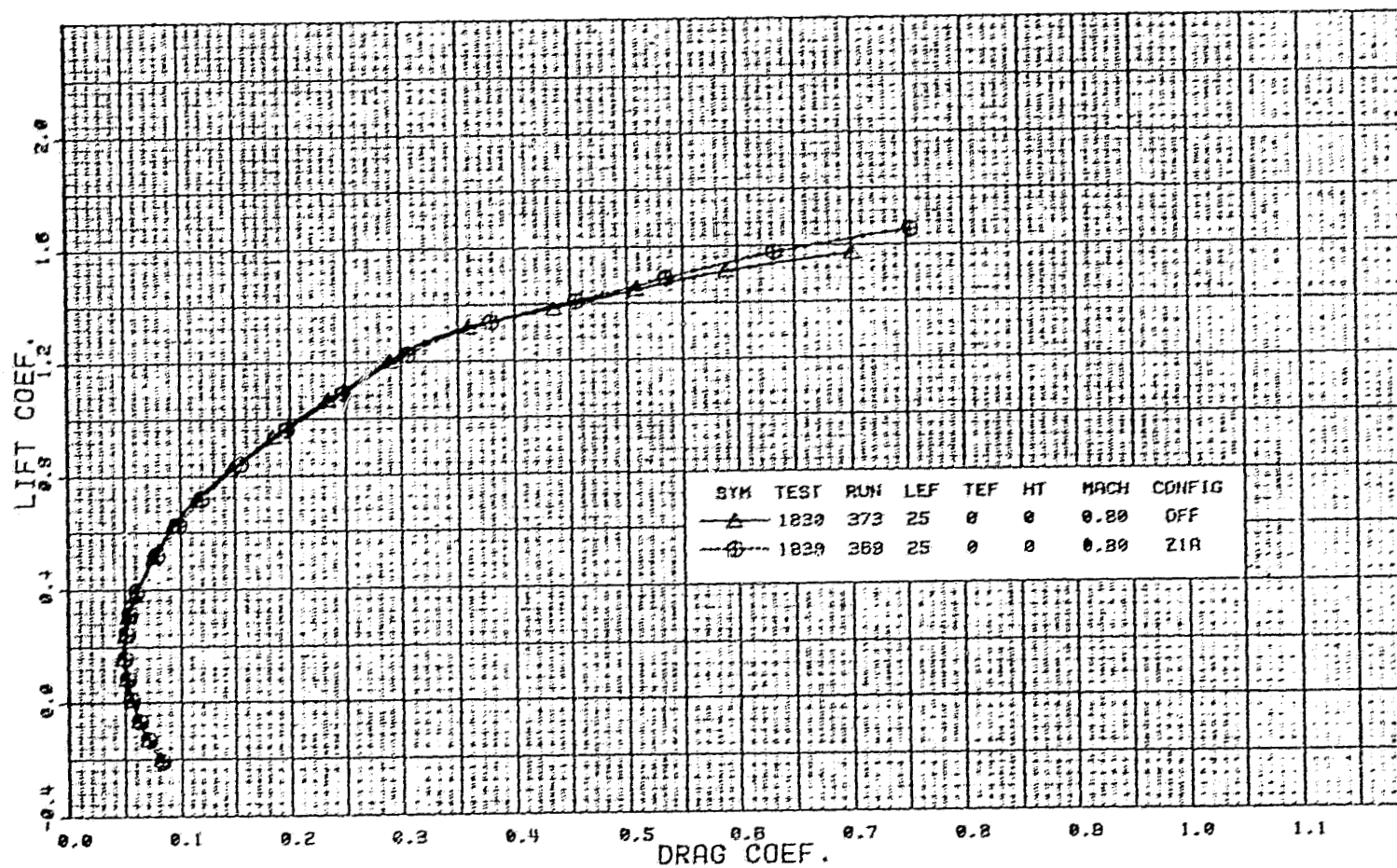


Figure 3-5 (b) Drag, Large Scale

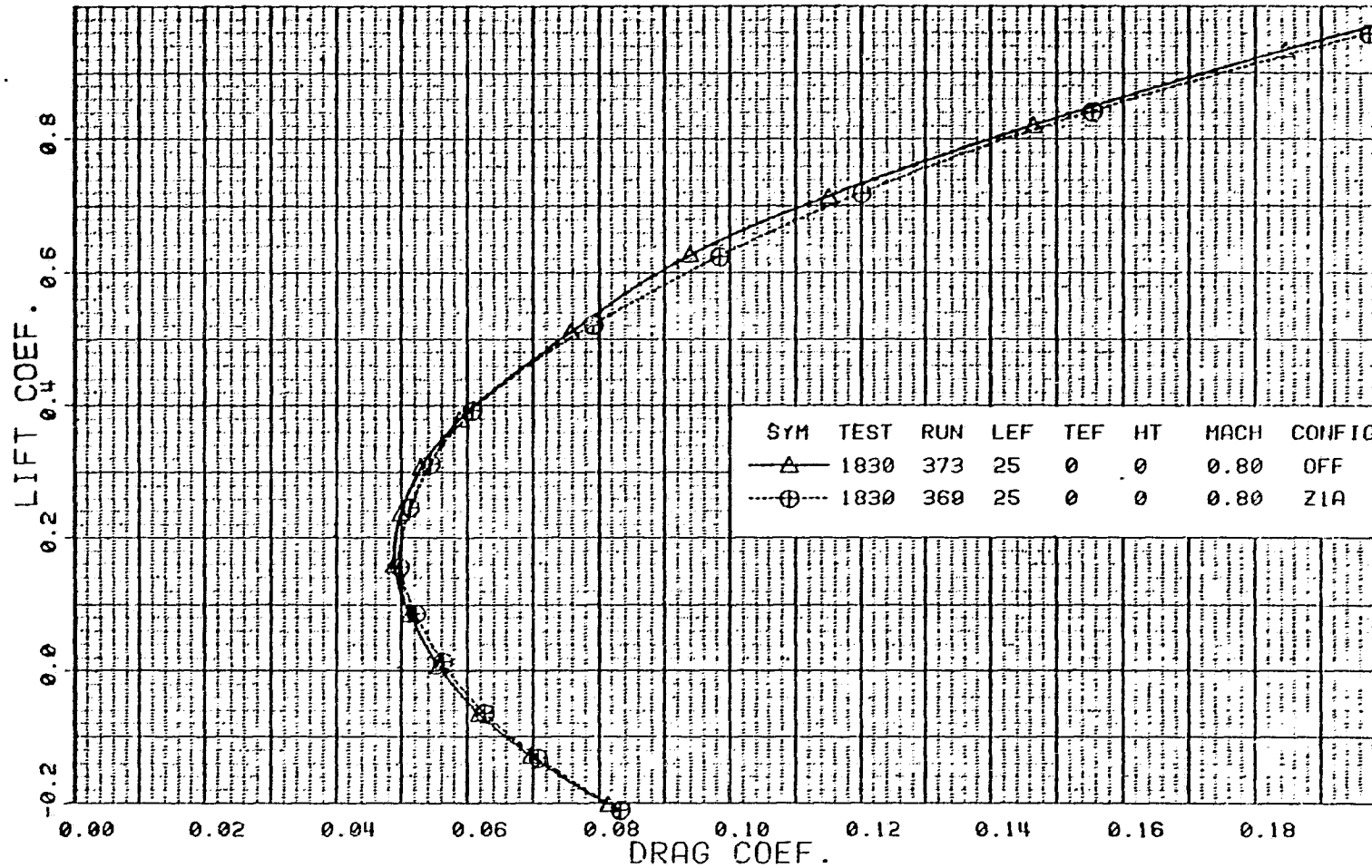


Figure 3-5 (c) Drag, Small Scale

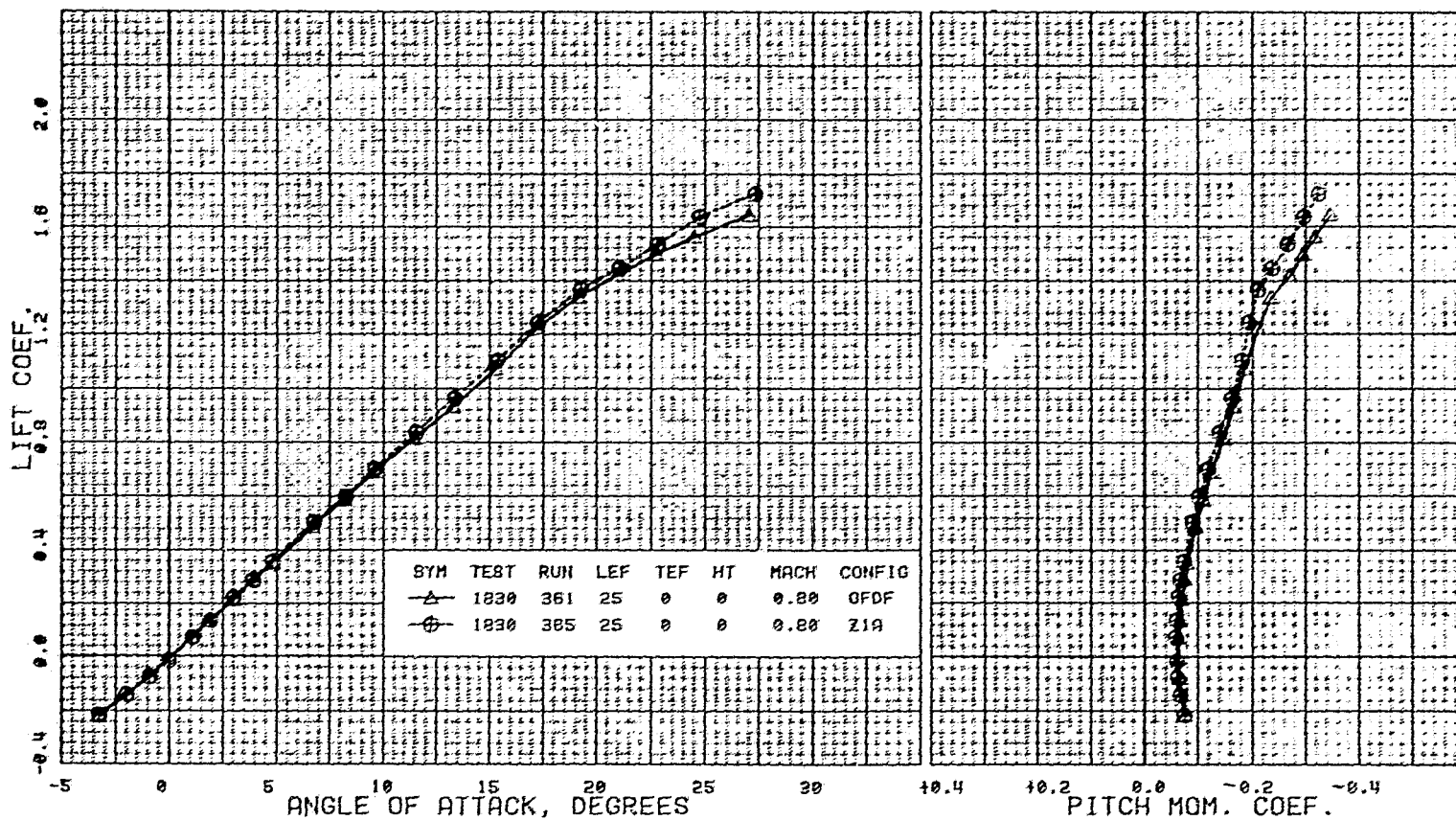


Figure 3-6 Effect of Canard Strake Z1A, Configuration 401F-2 with Single Vertical Tail, $M = 0.80$
(a) Lift and Pitching Moment

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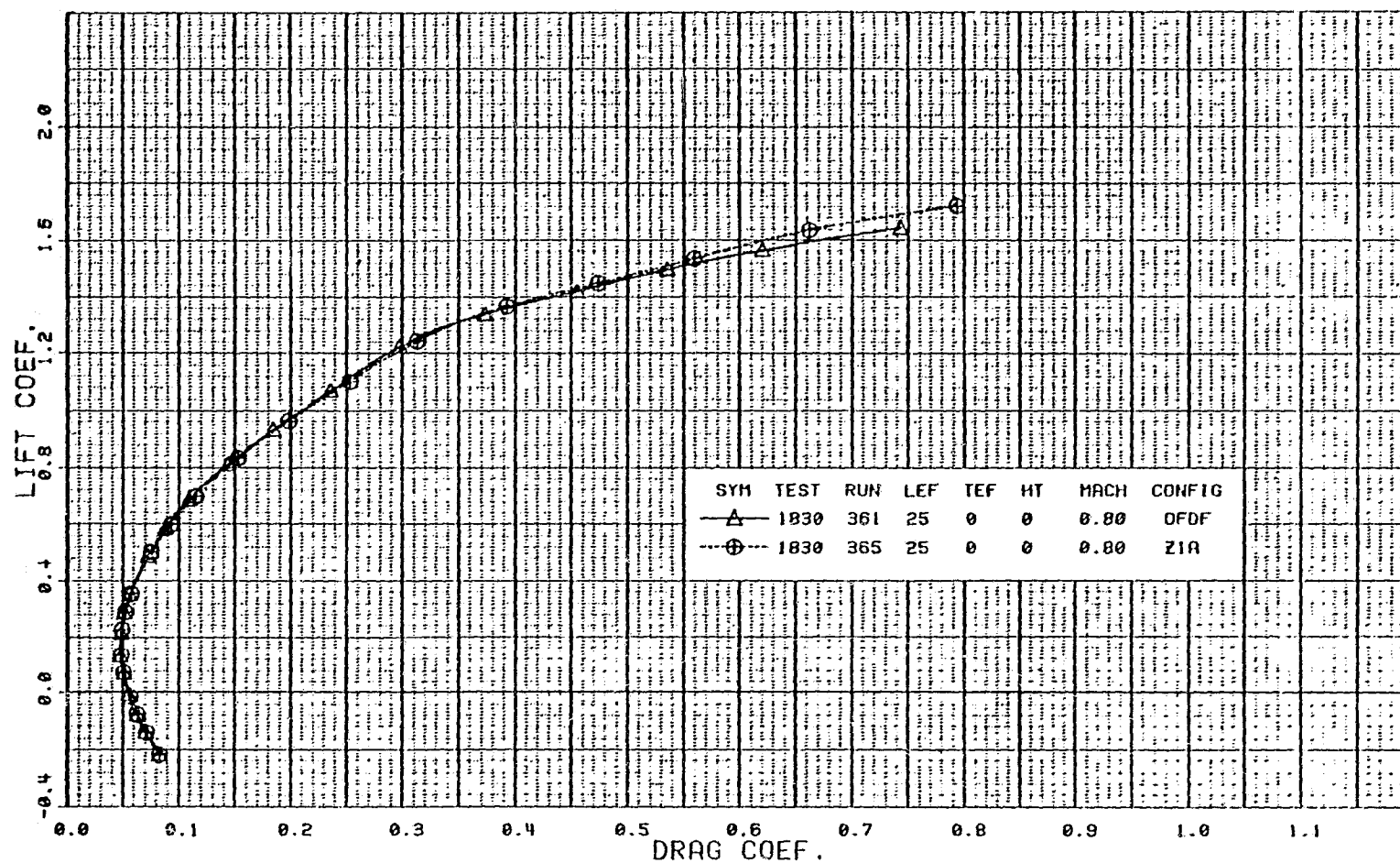


Figure 3-6 (b) Drag, Large Scale

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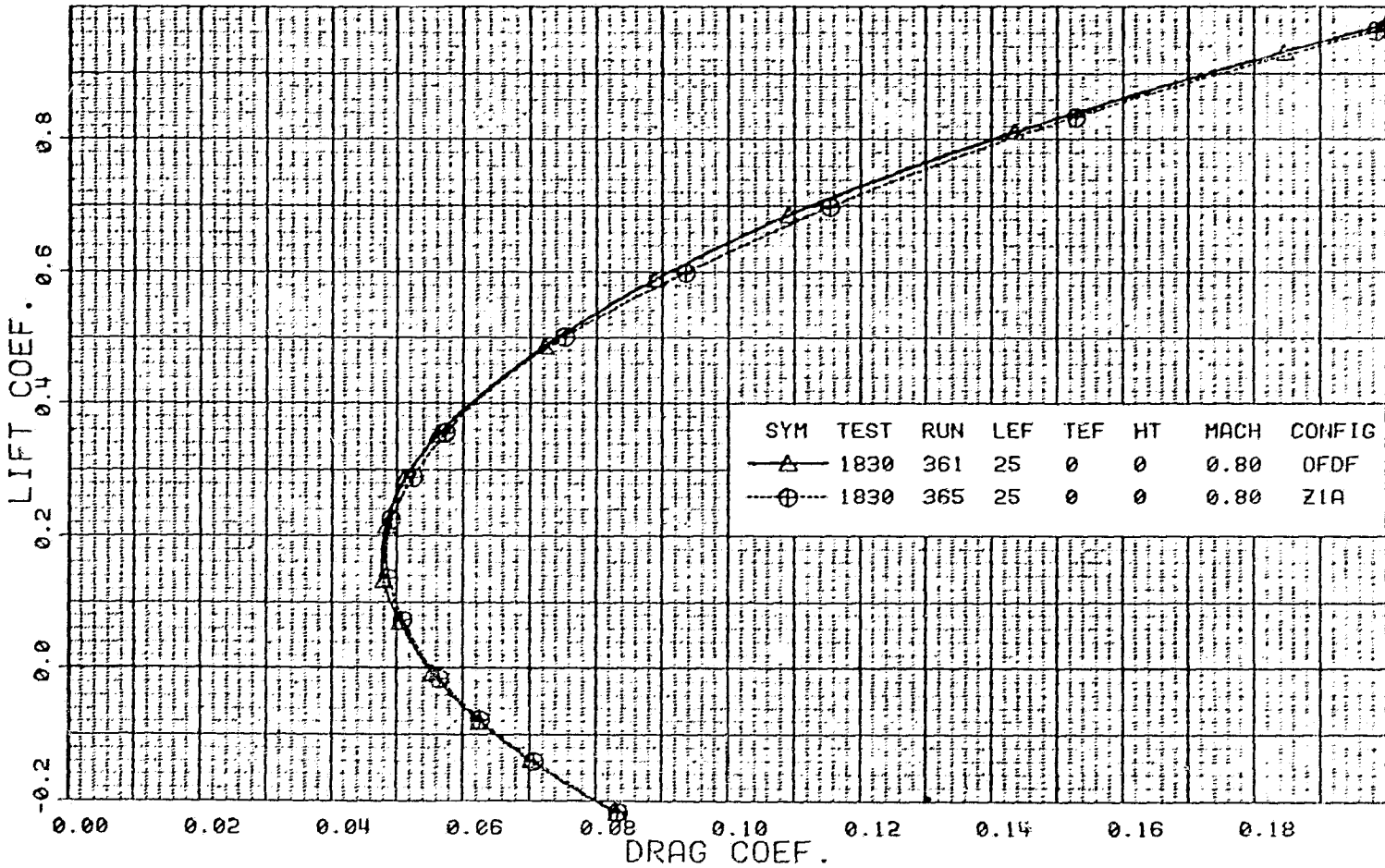


Figure 3-6 (c) Drag, Small Scale

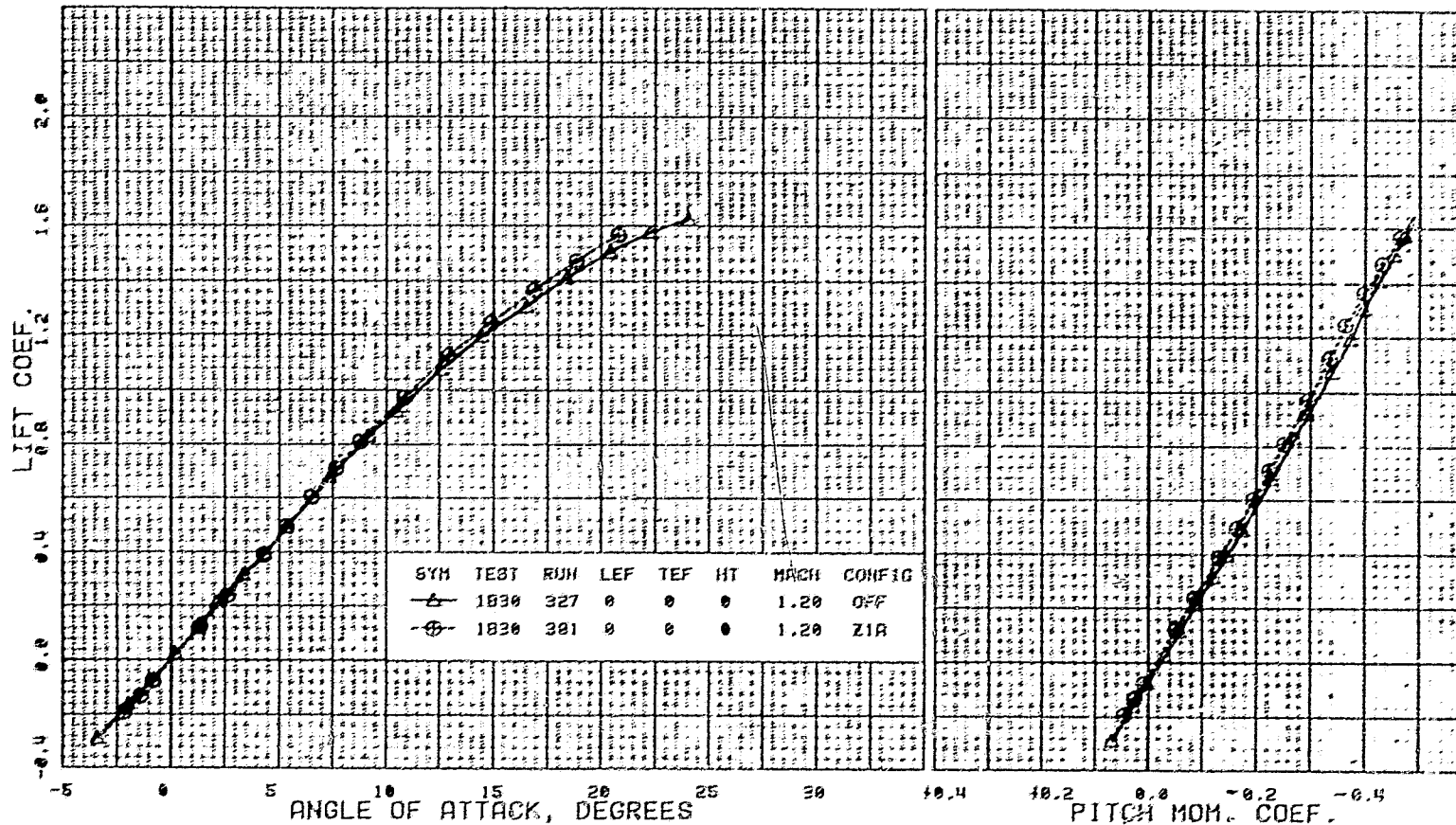


Figure 397 Effect of Canard Strake Z1A, Configuration 401F-2 with Twin Vertical Tails, M = 1.20
(a) Lift and Pitching Moment

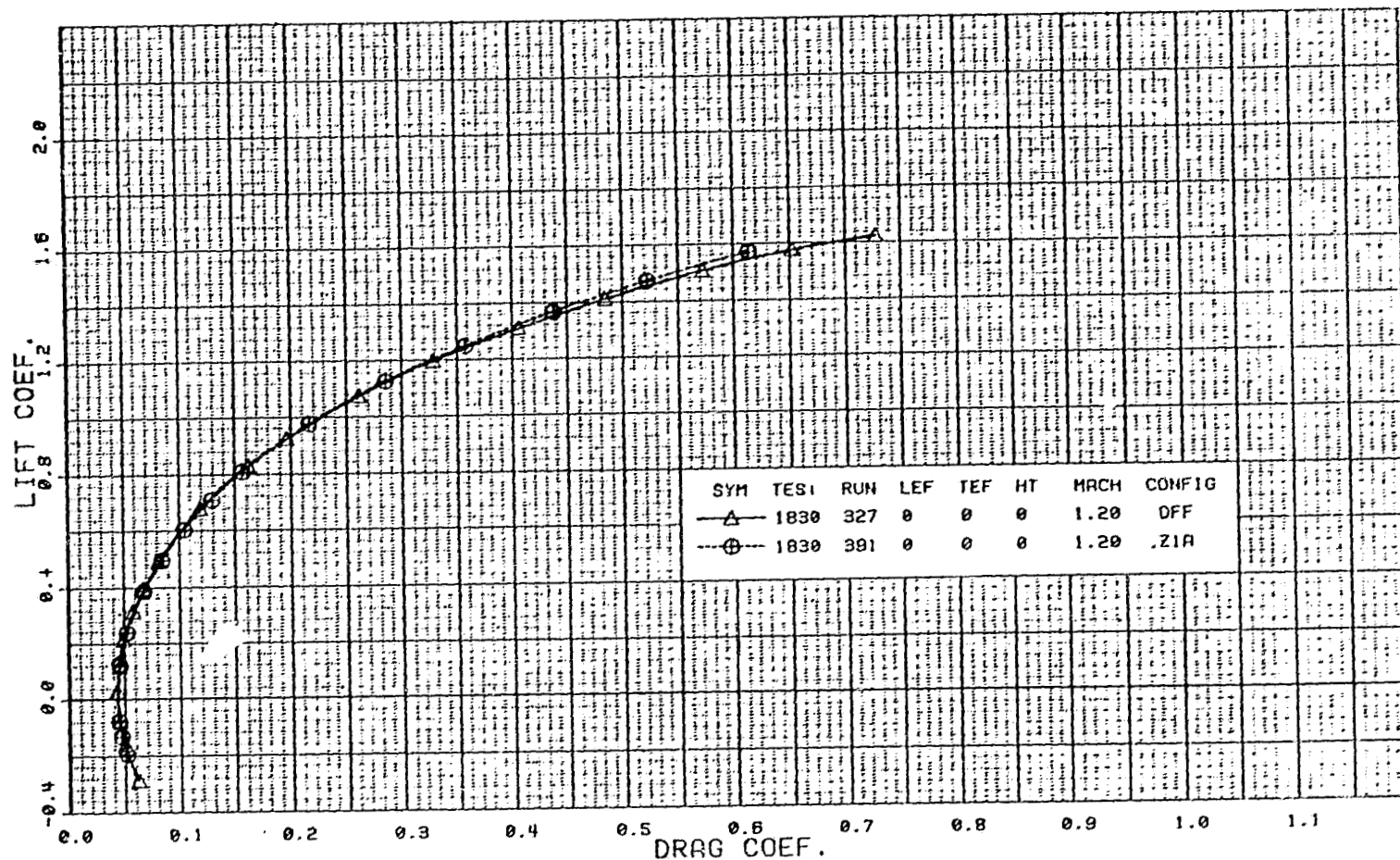


Figure 3-7 (b) Drag, Large Scale

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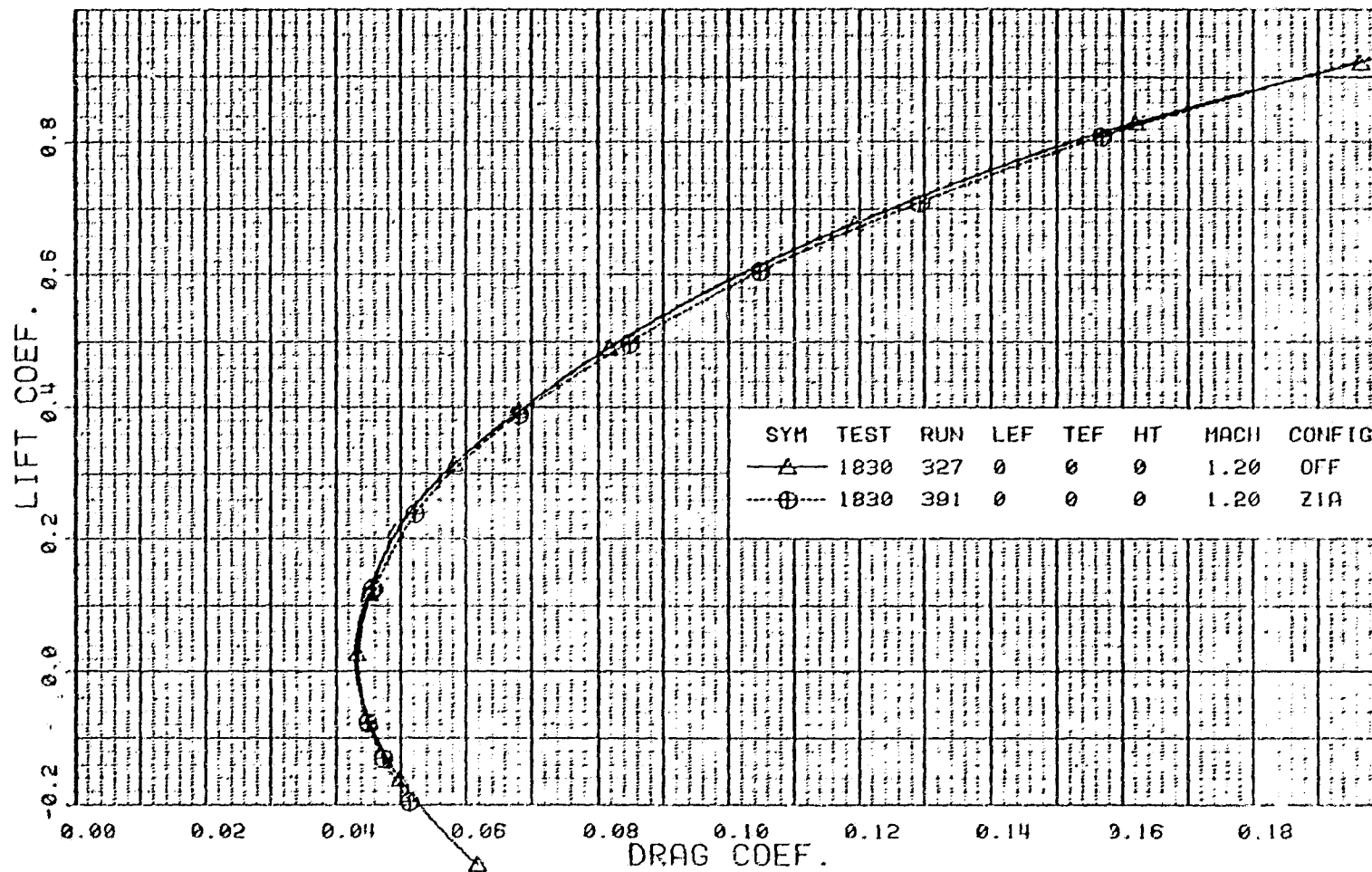


Figure 3-7 (c) Drag, Small Scale

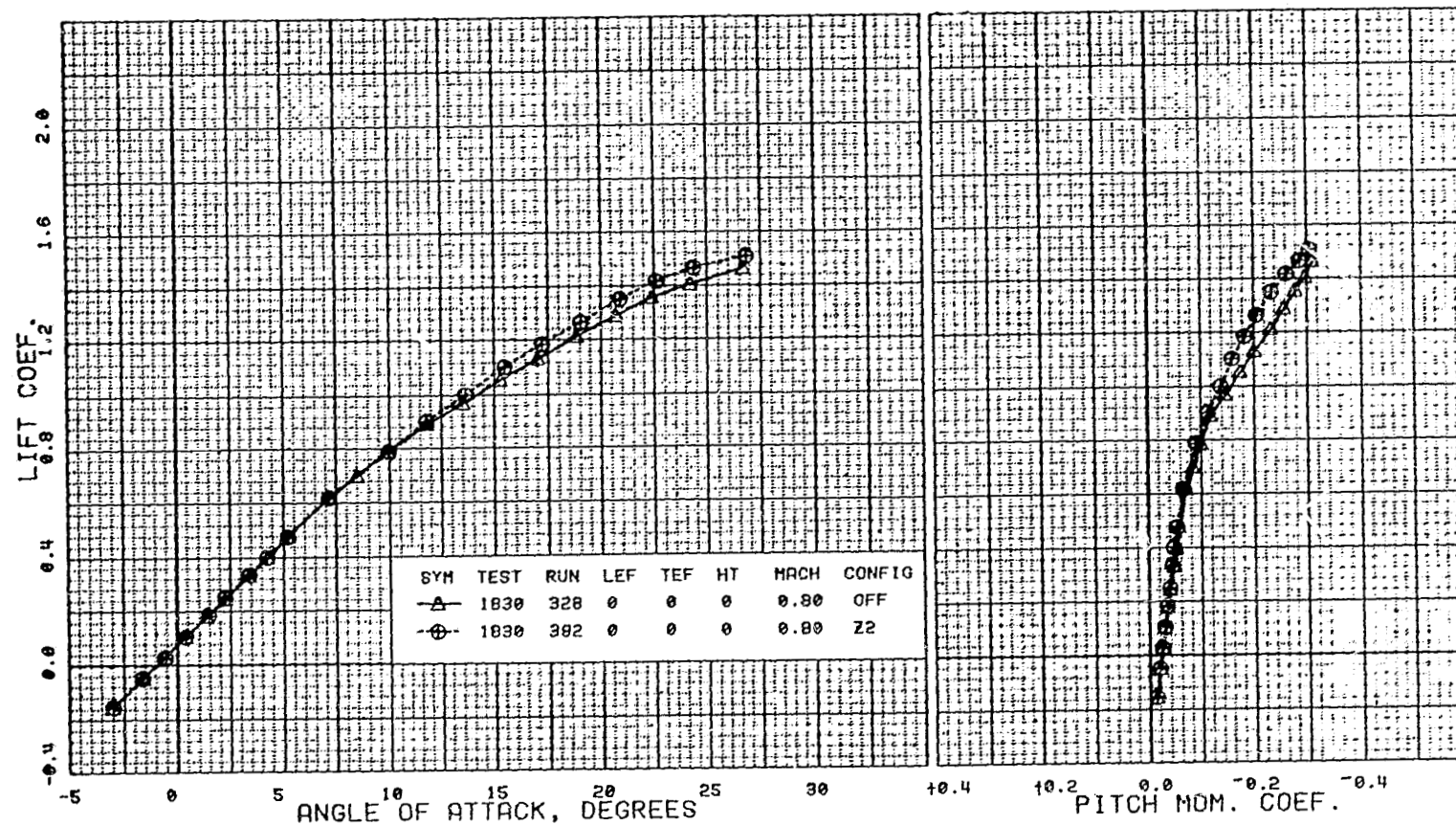


Figure 3-8 Effect of Canard Strake Z2, Configuration 4017-2 with Twin Vertical Tails
(a) Lift and Pitching Moment

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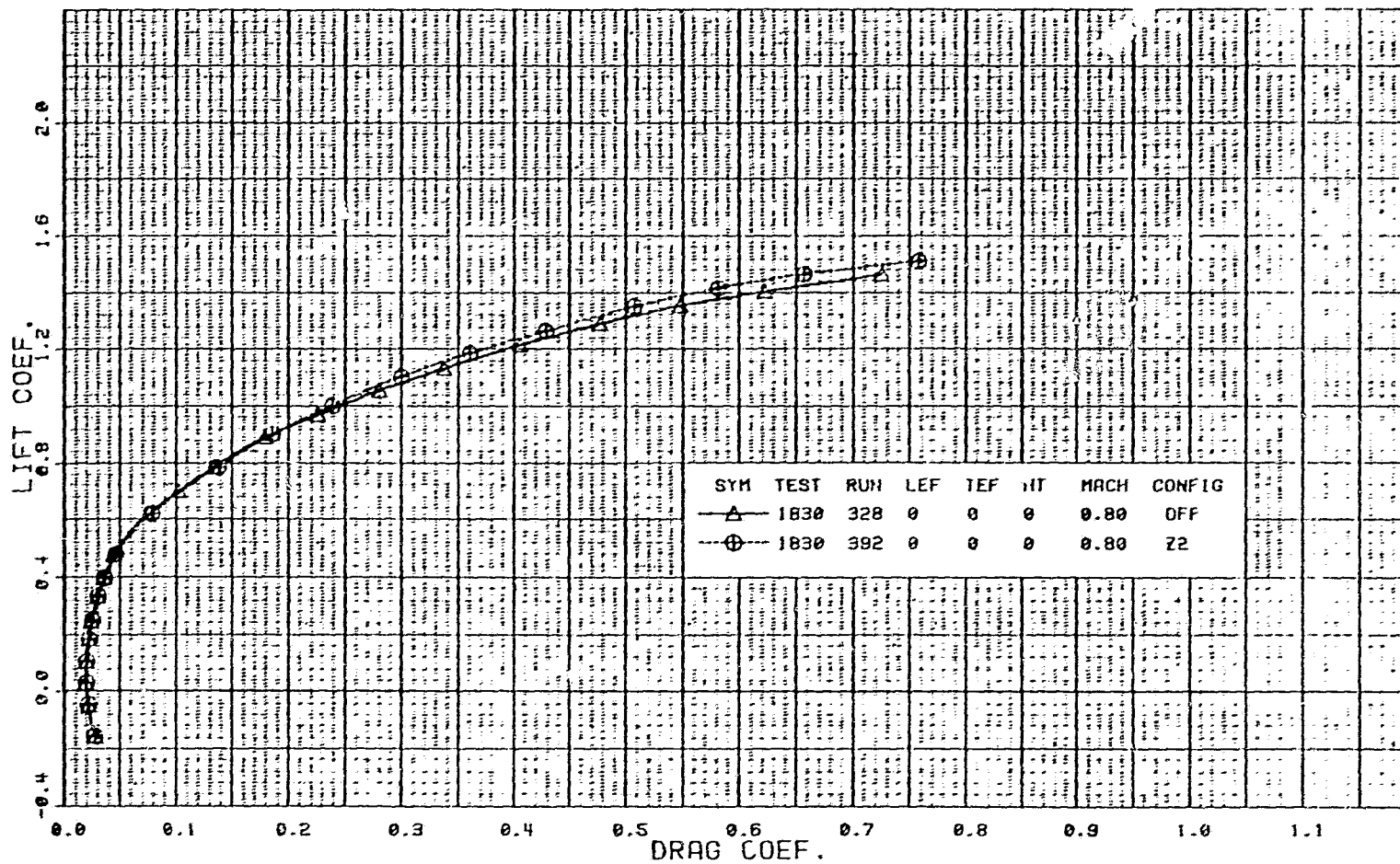


Figure 3-8 (b) Drag, Large Scale

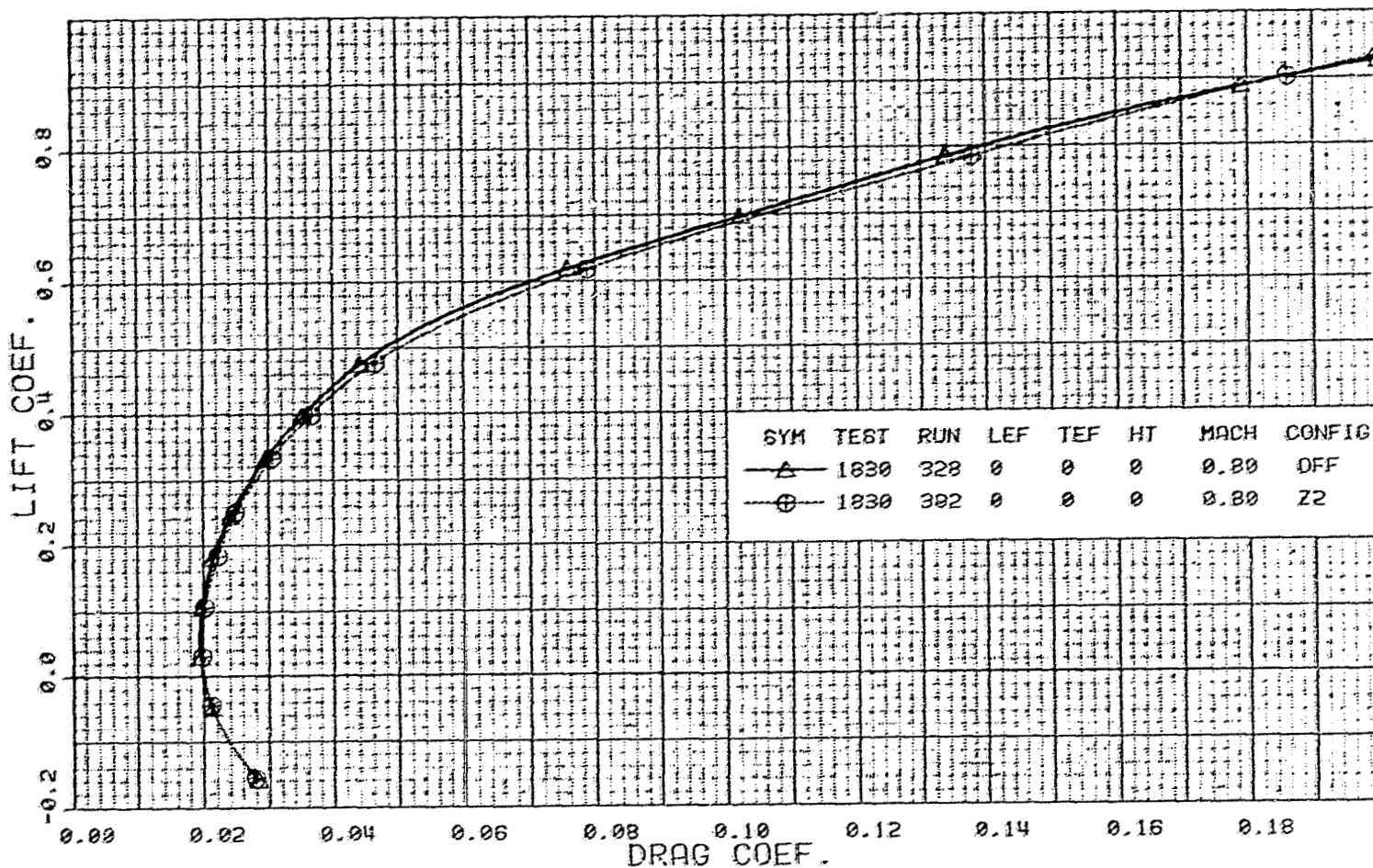


Figure 3-8 (c) Drag, Small Scale

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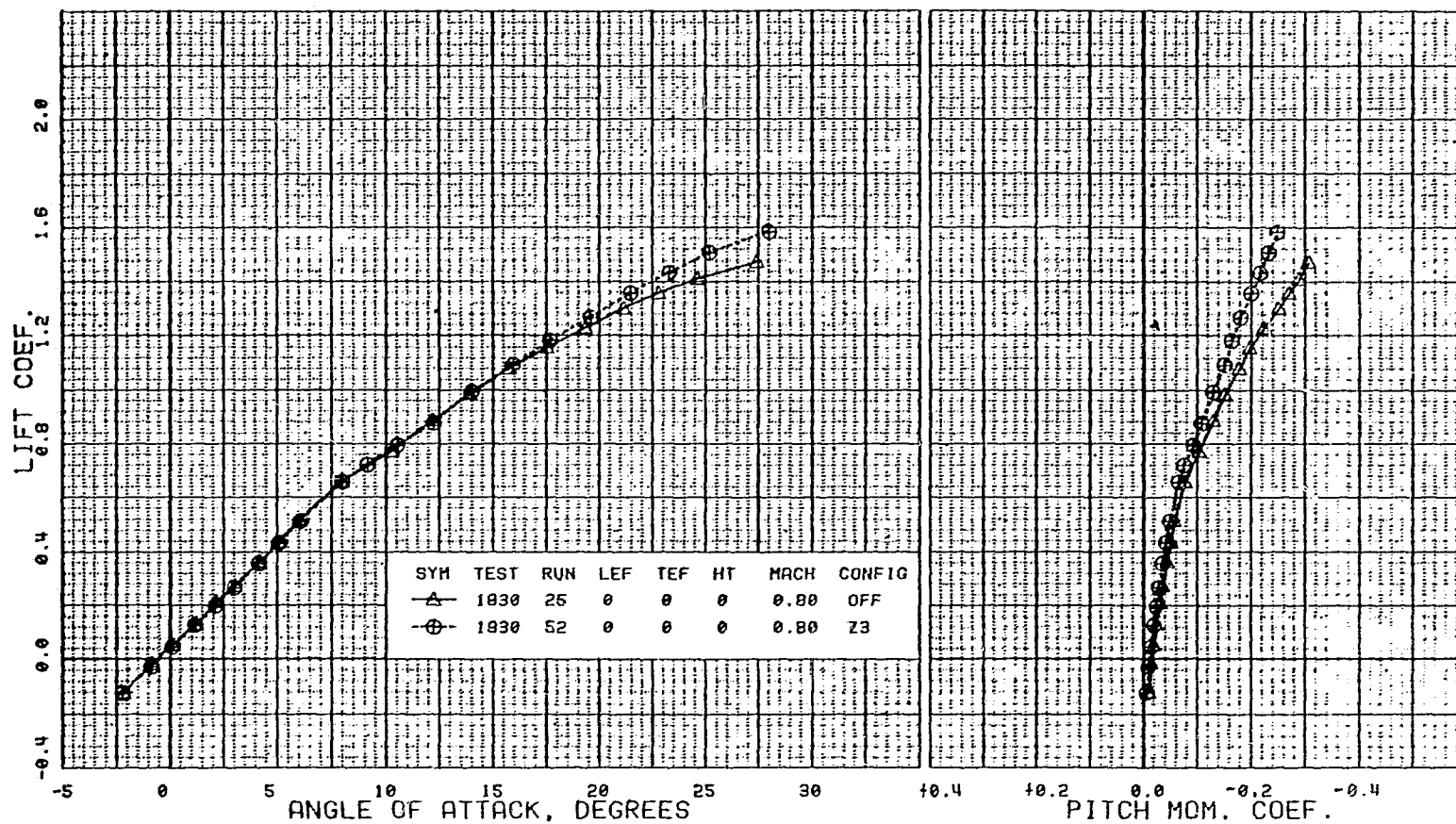
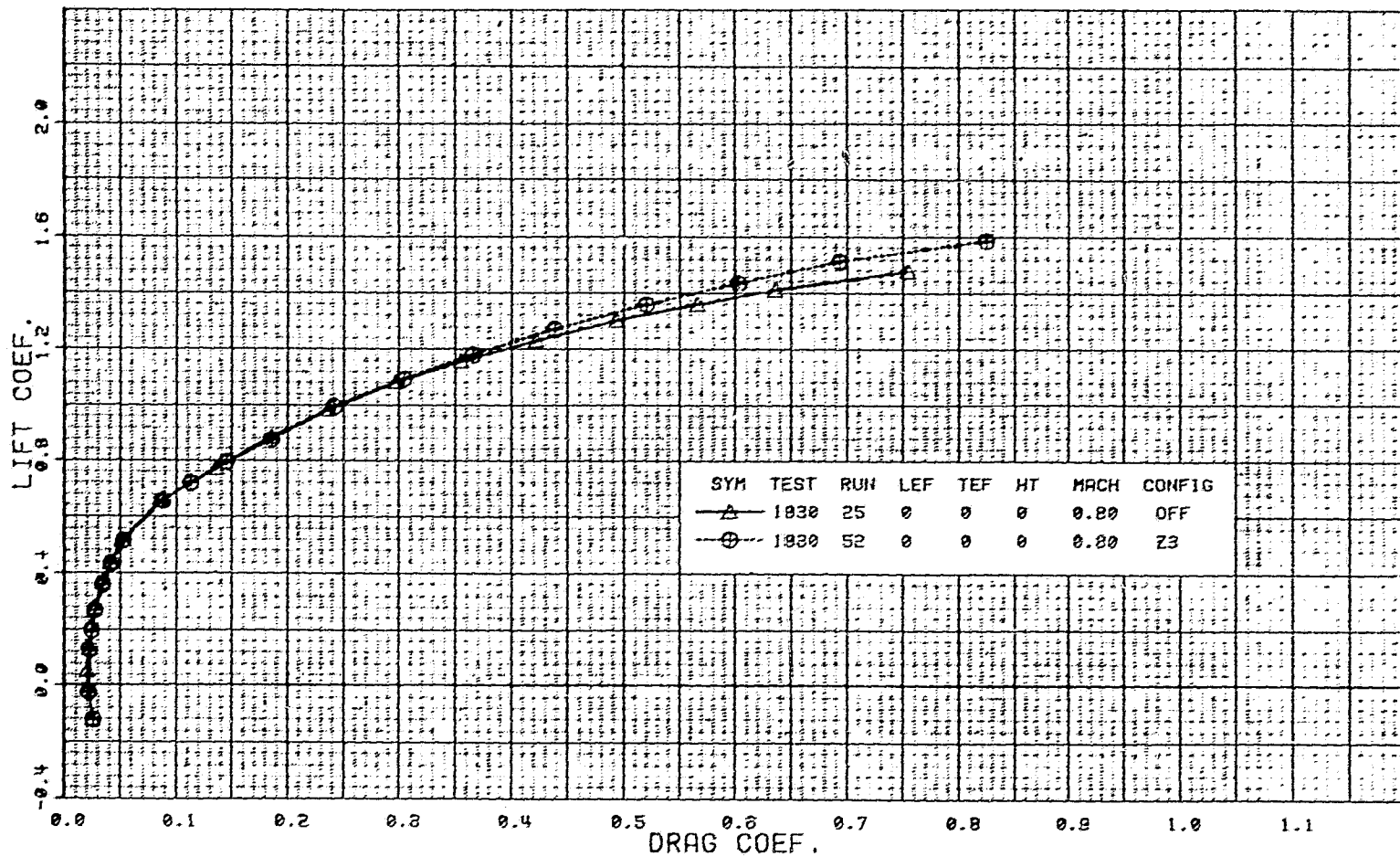


Figure 3-9 Effect of Canard Stroke Z3, Configuration 401F-4, $M = 0.80$
 (a) Lift and Pitching Moment



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Figure 3-9 (b) Drag, Large Scale

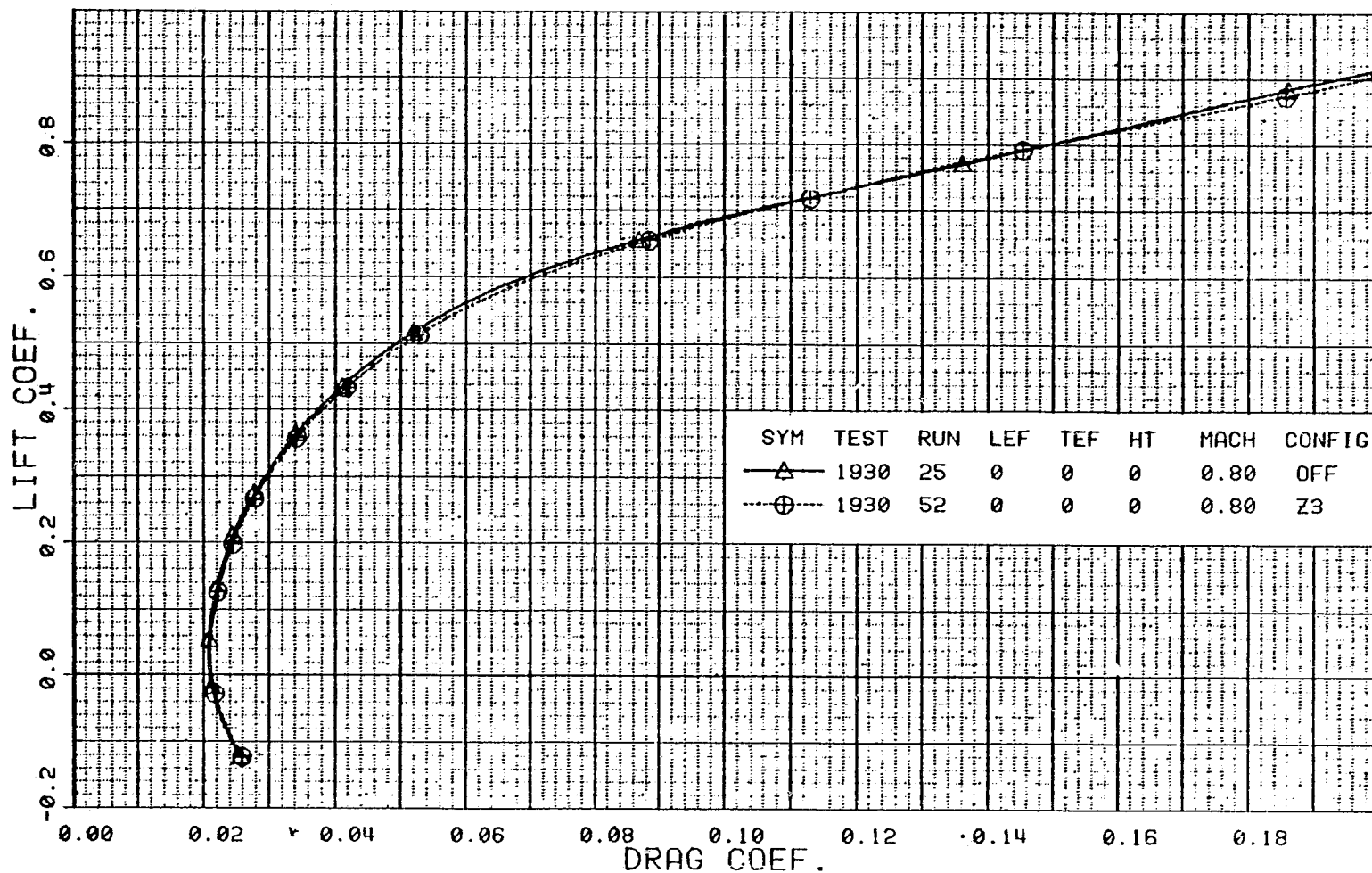


Figure 3-9 (c) Drag, Small Scale

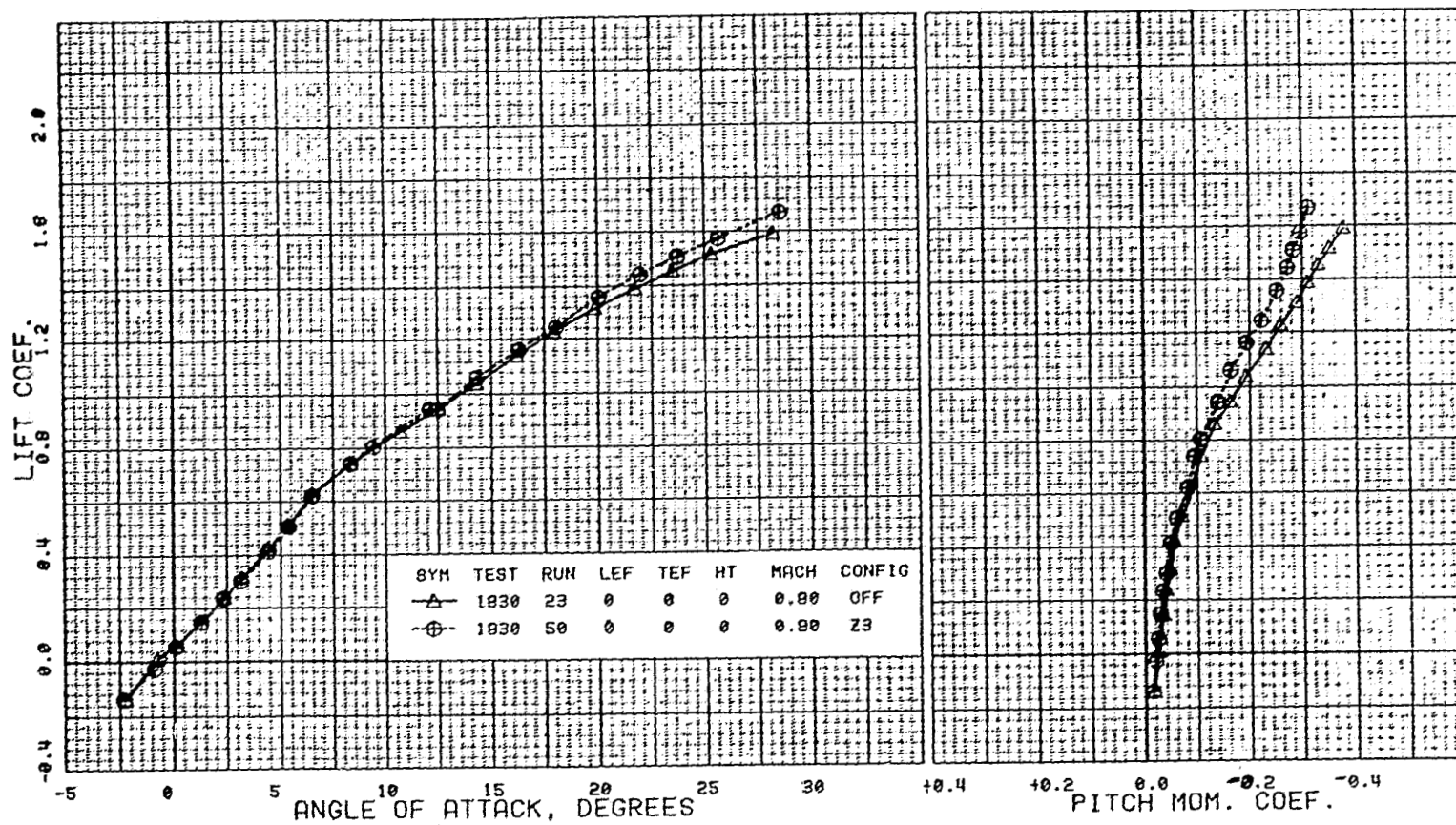


Figure 3-10 Effect of Canard Strake Z3, Configuration 401F-4, $M = 0.90$
(a) Lift and Pitching Moment

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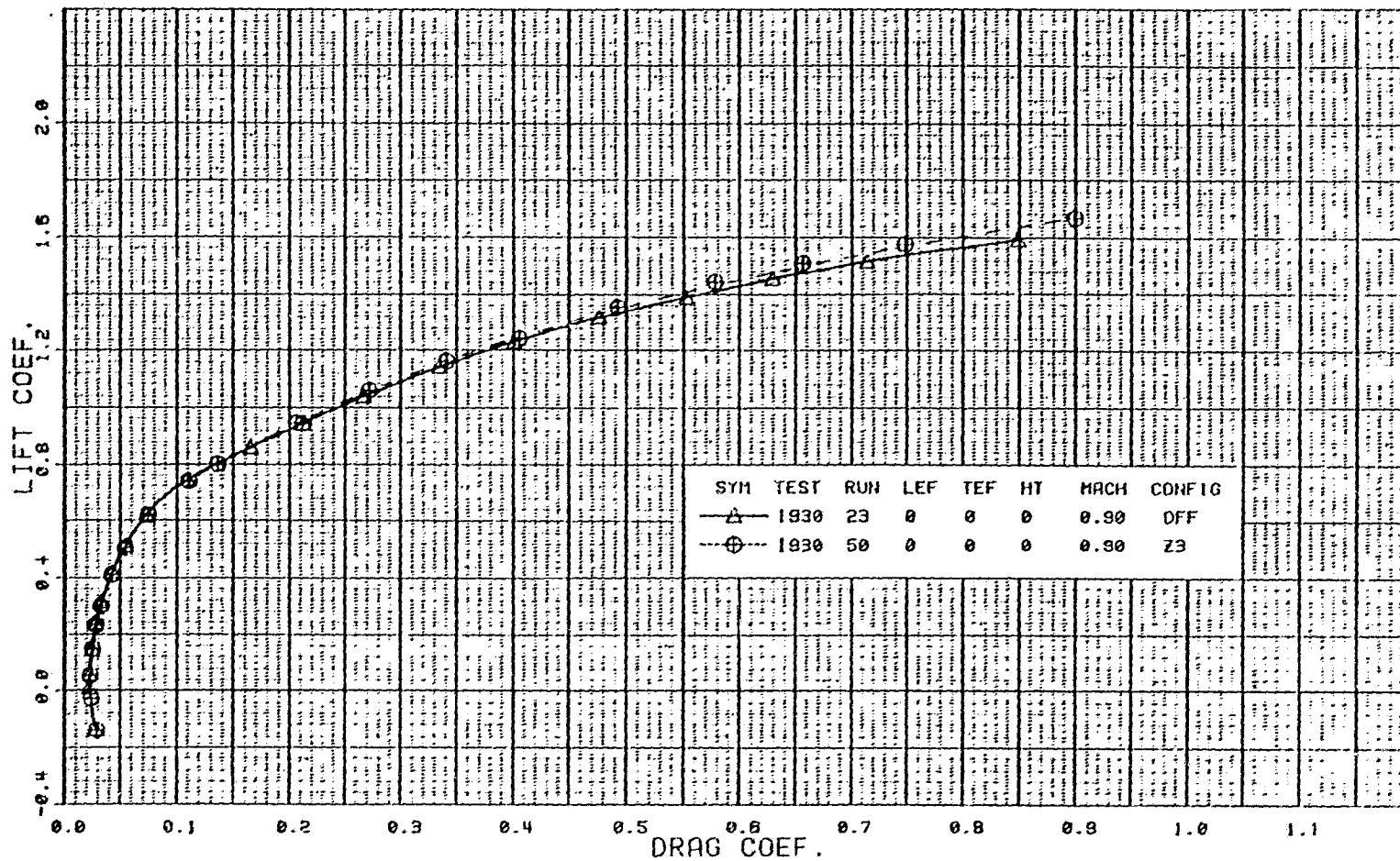


Figure 3-10 (b) Drag, Large Scale

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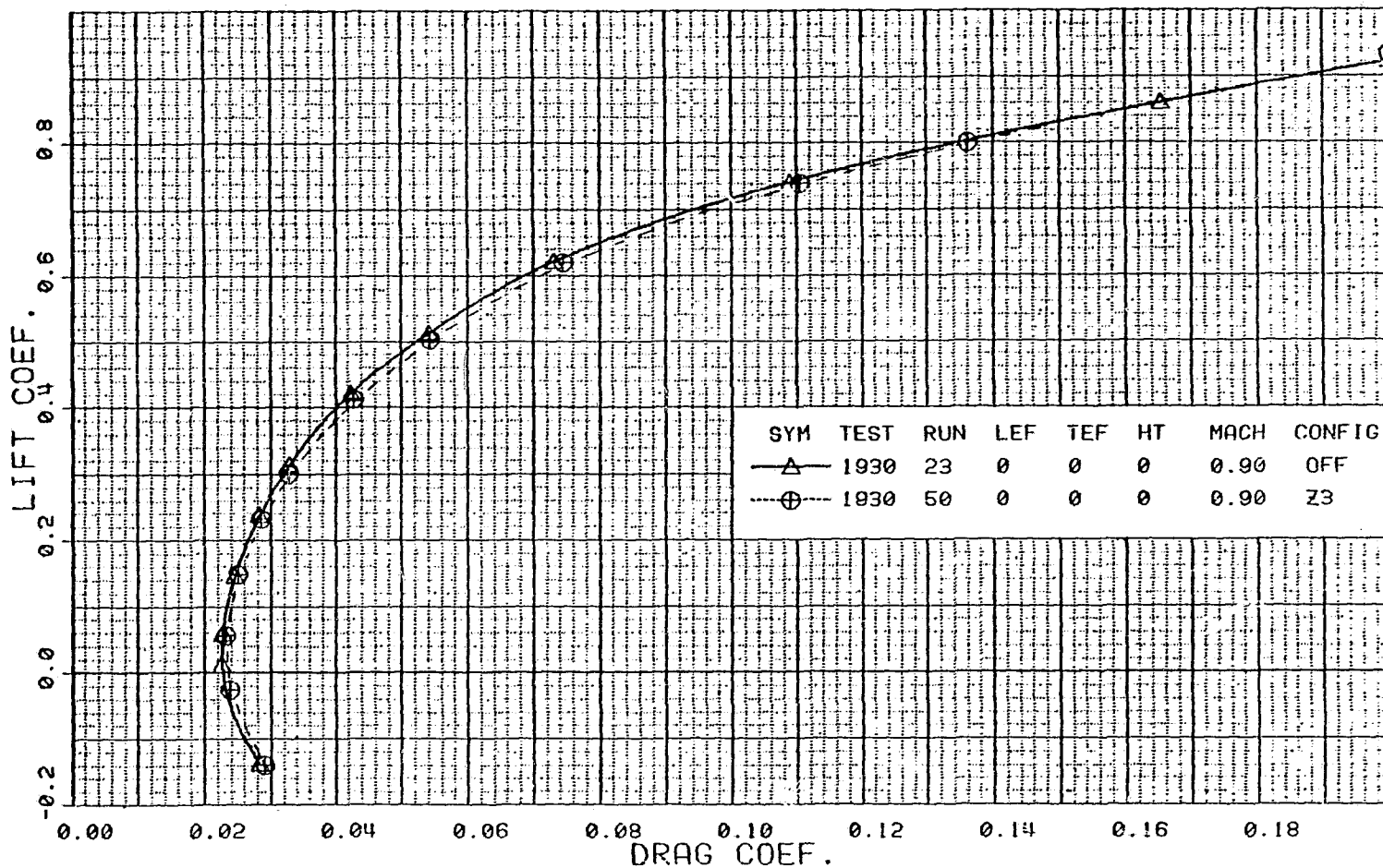


Figure 3-10 (c) Drag, Small Scale

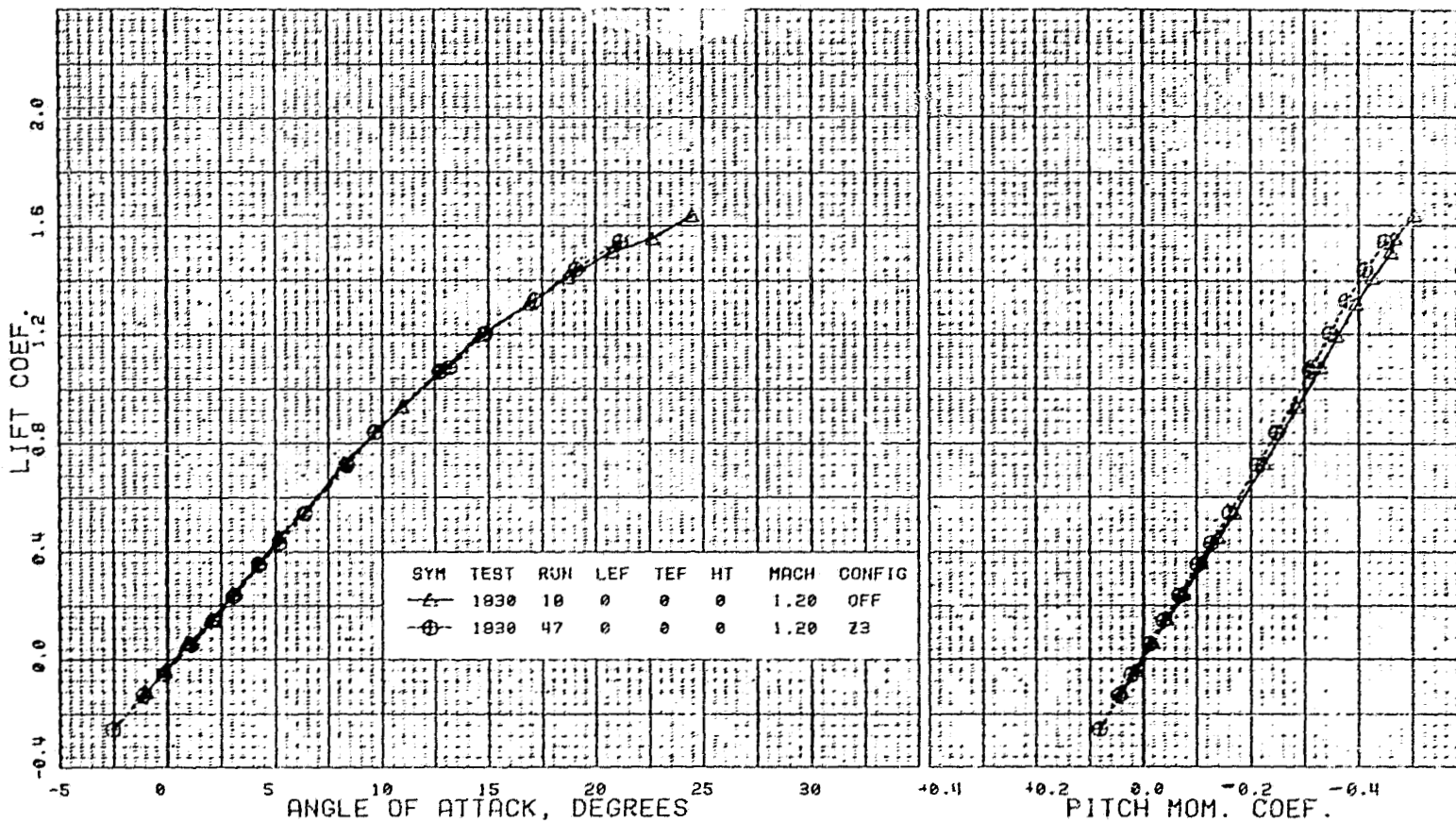


Figure 3-11 Effect of Canard Strake 23, Configuration 401F-4, M = 1.20
(a) Lift and Pitching Moment

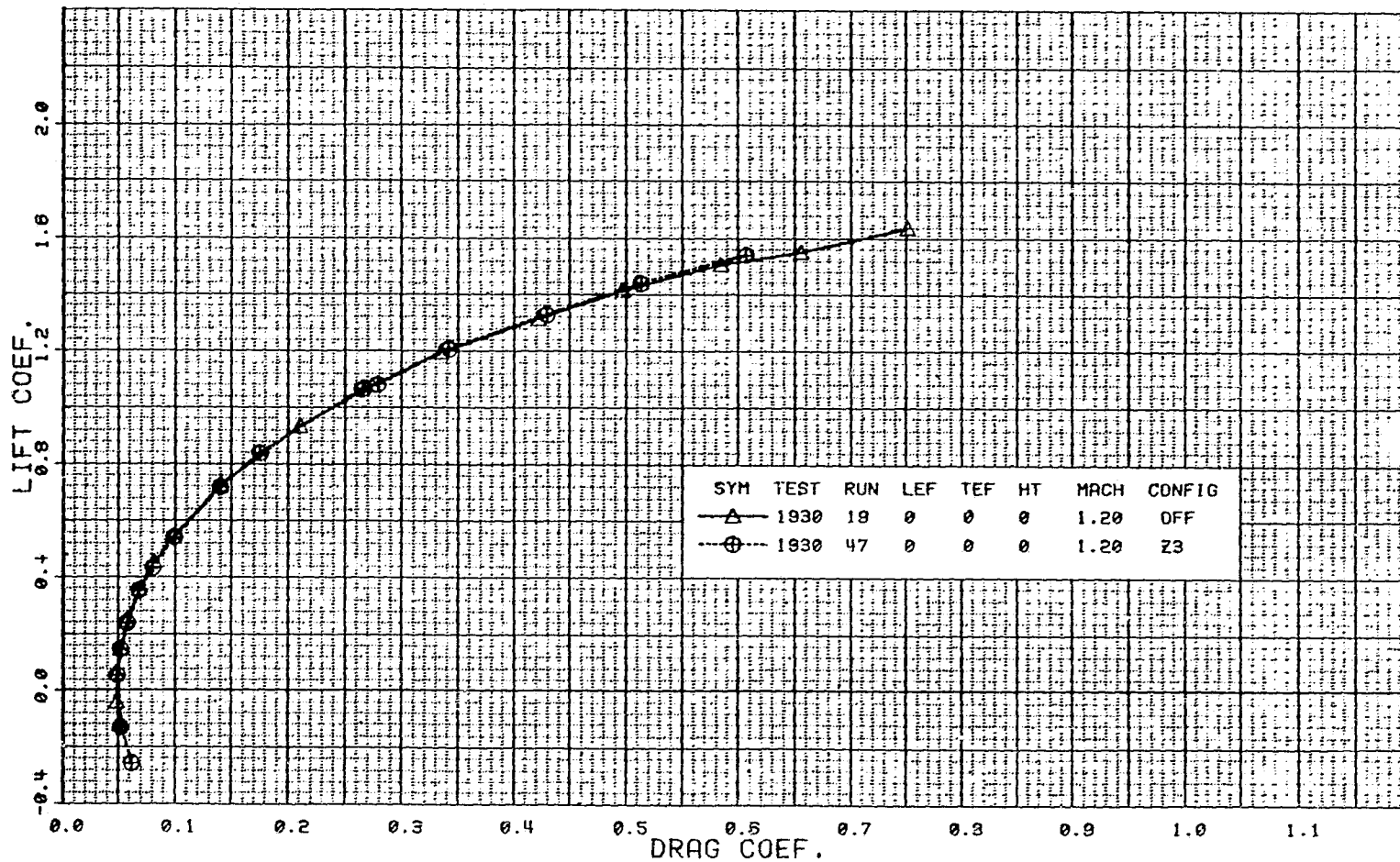


Figure 3-11 (b) Drag, Large Scale

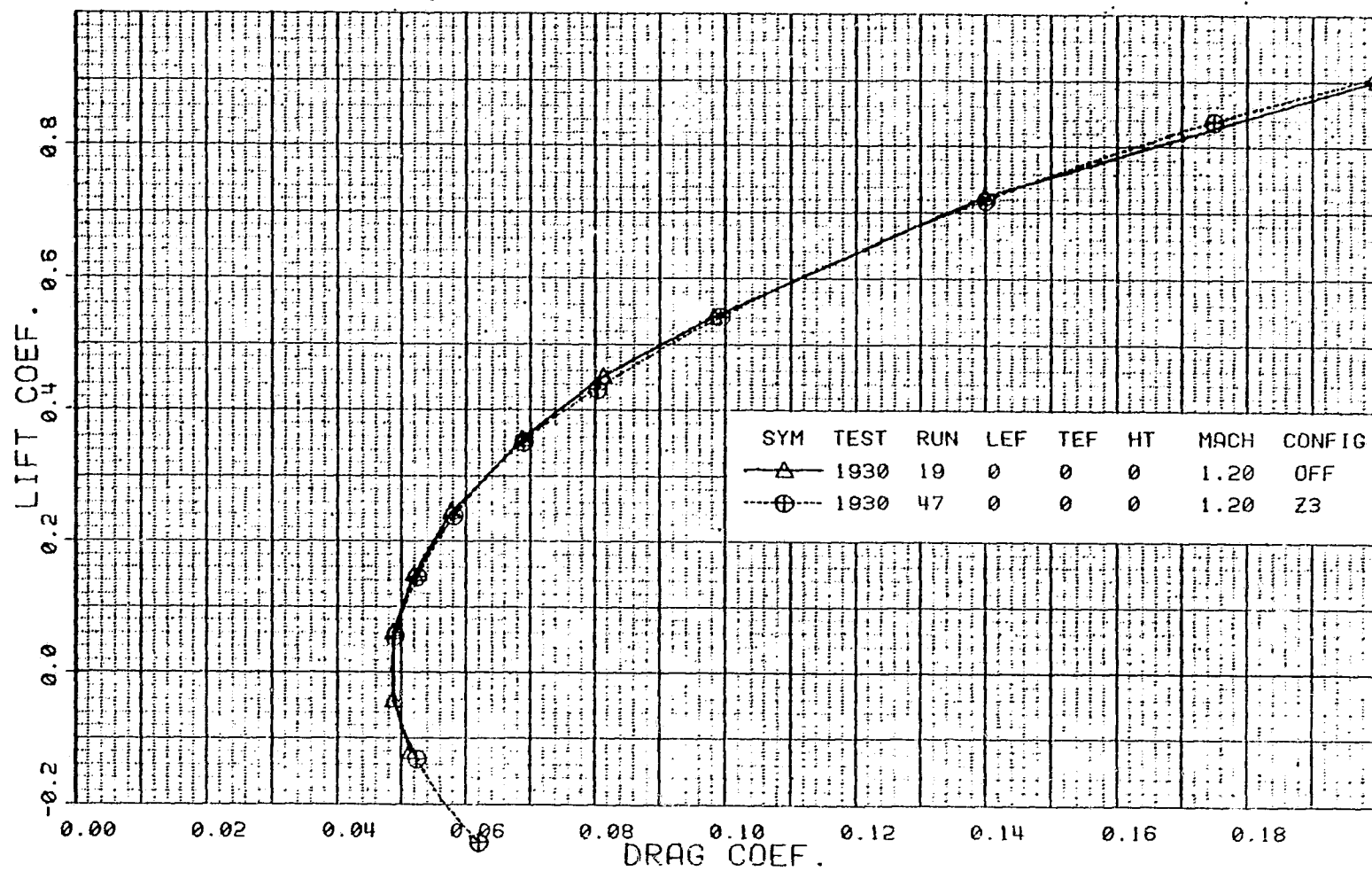


Figure 3-11 (c) Drag, Small Scale

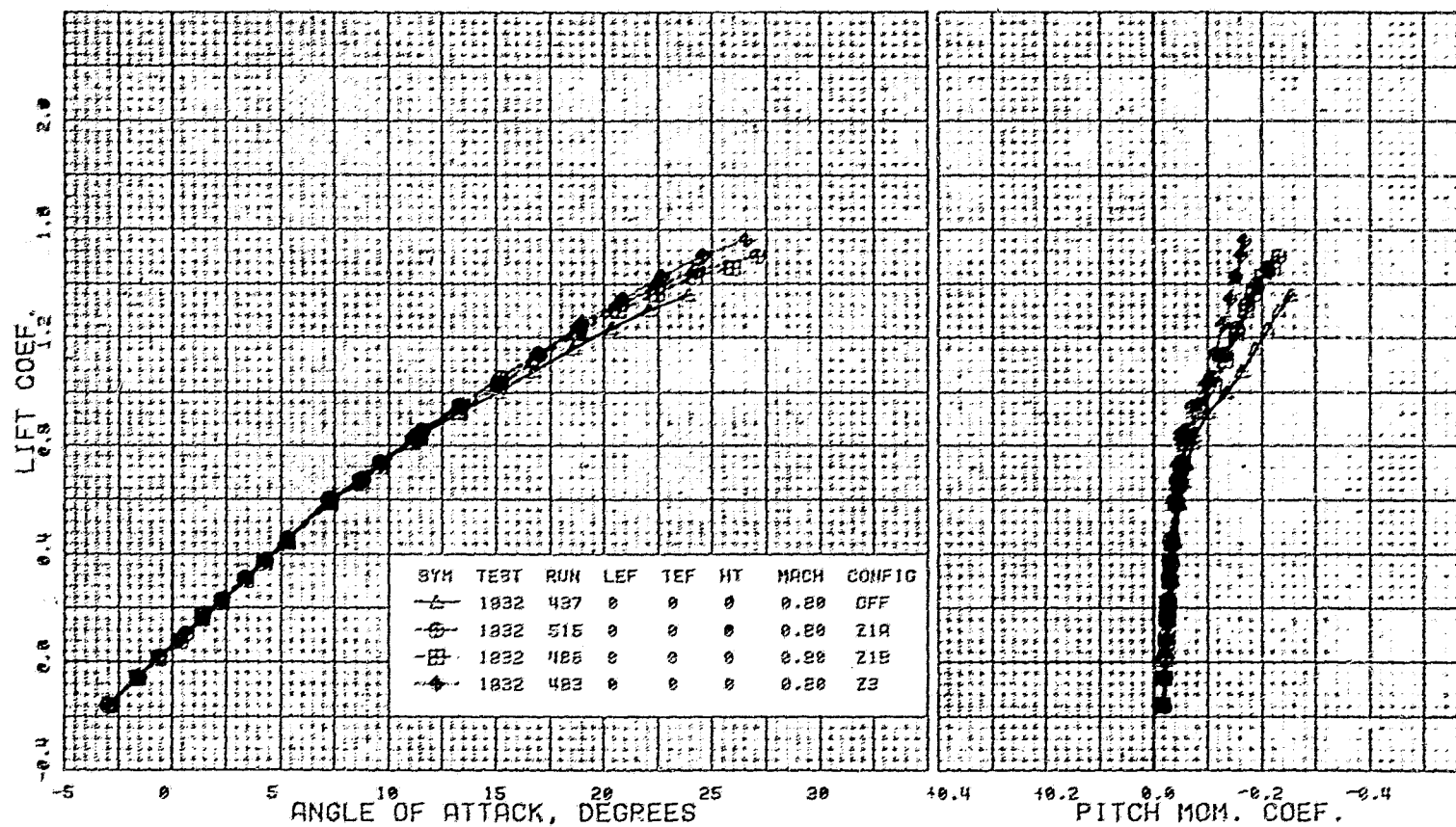


Figure 3-12 Comparison of Canard Strakes (Z1A, Z1B, Z3) Configuration
401F-5, $M = 0.80$
(a) Lift and Pitching Moment

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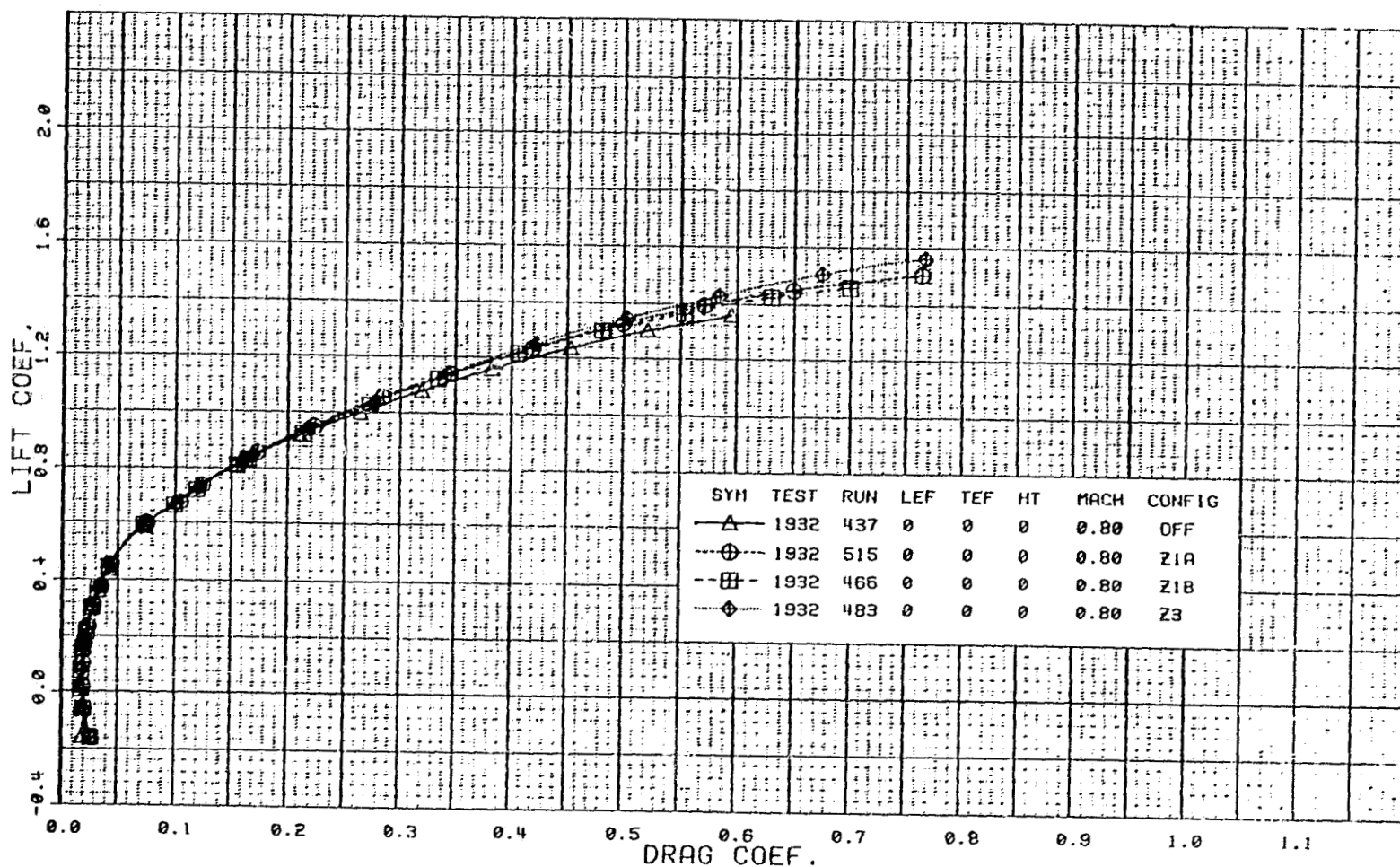


Figure 3-12 (b) Drag, Large Scale

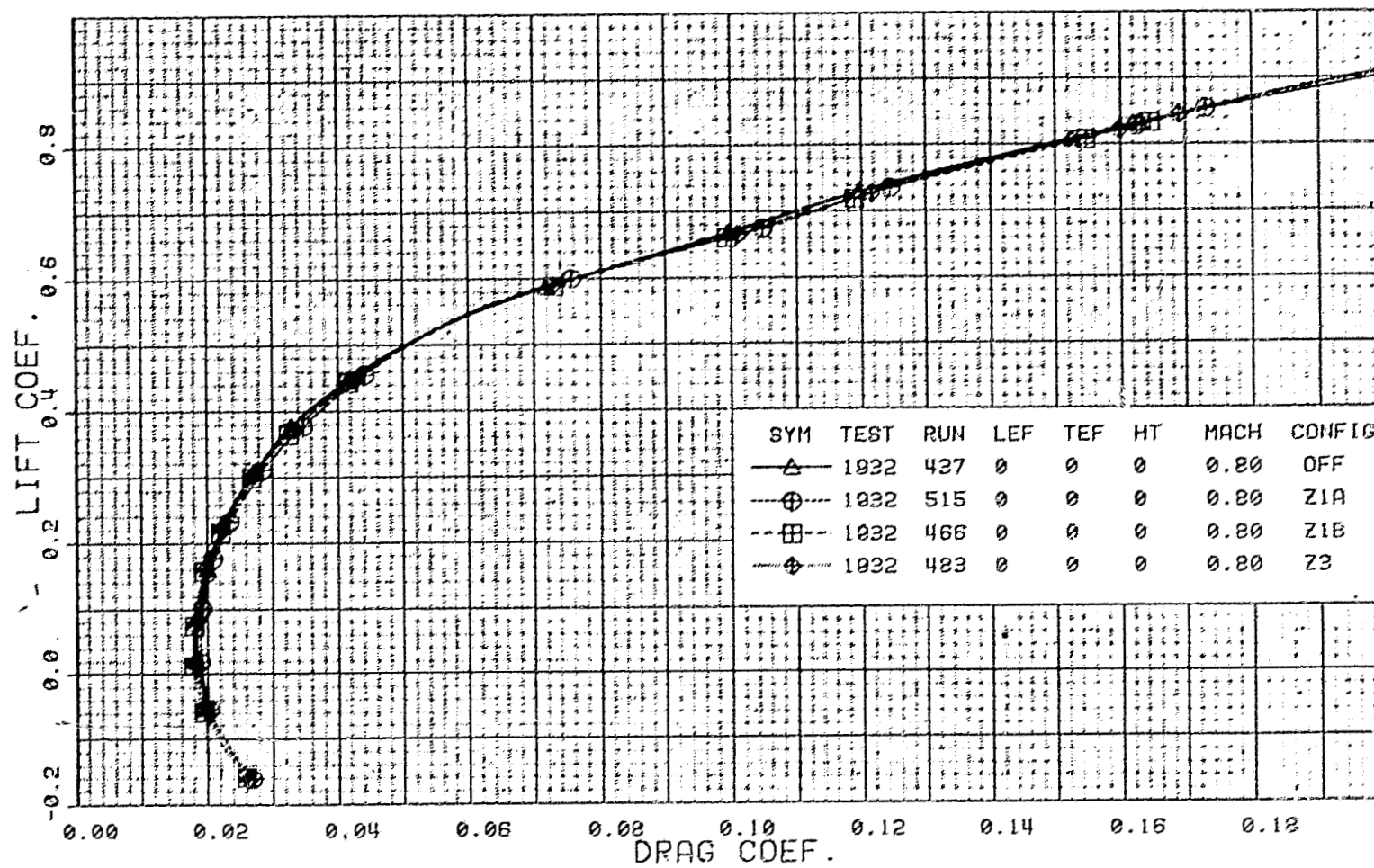


Figure 3-12 (c) Drag, Small Scale

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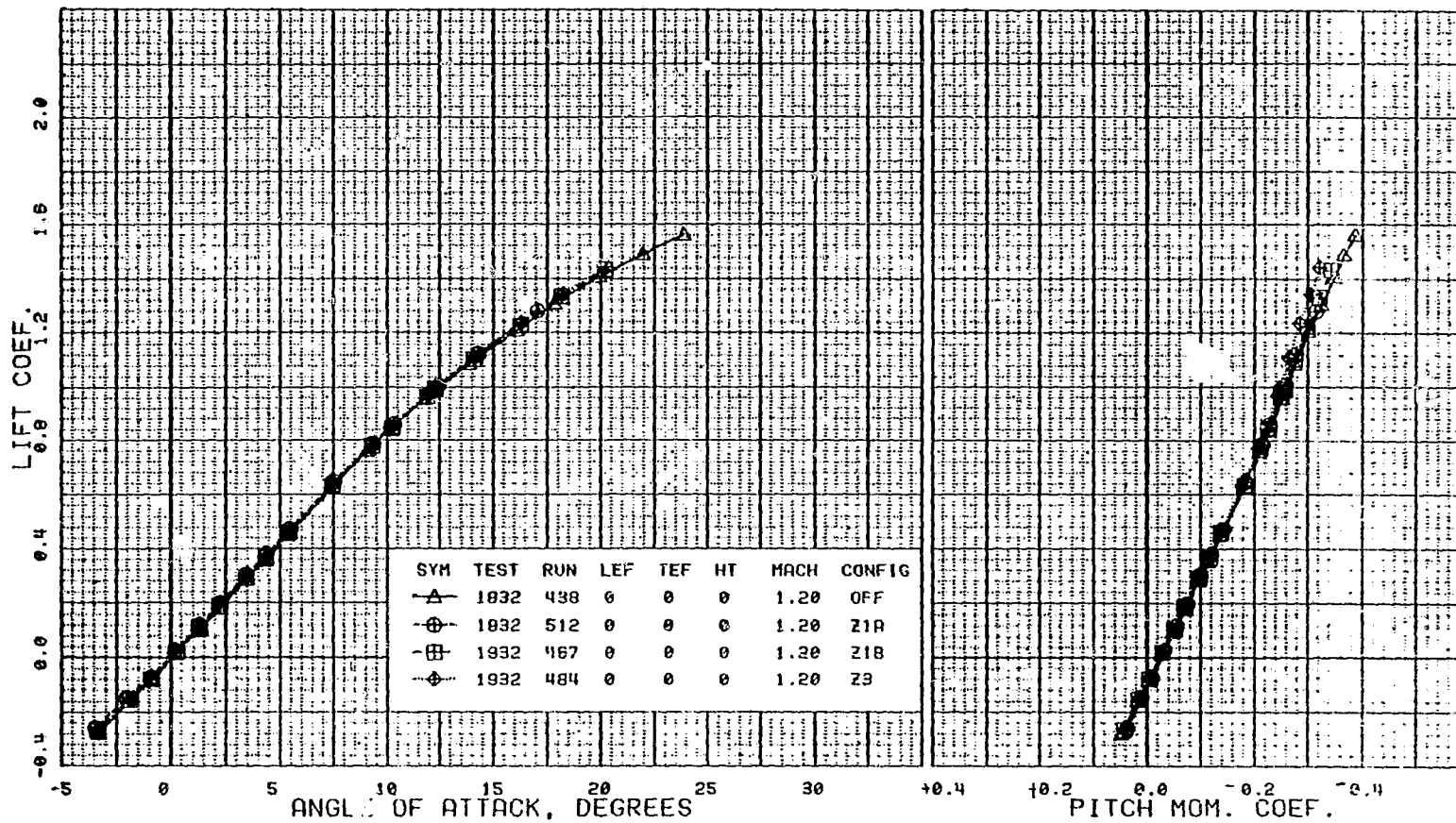


Figure 3-13 Comparison of Canard Strakes (Z1A, Z1B, Z3), Configuration 401F-5, $M = 1.20$
(a) Lift and Pitching Moment

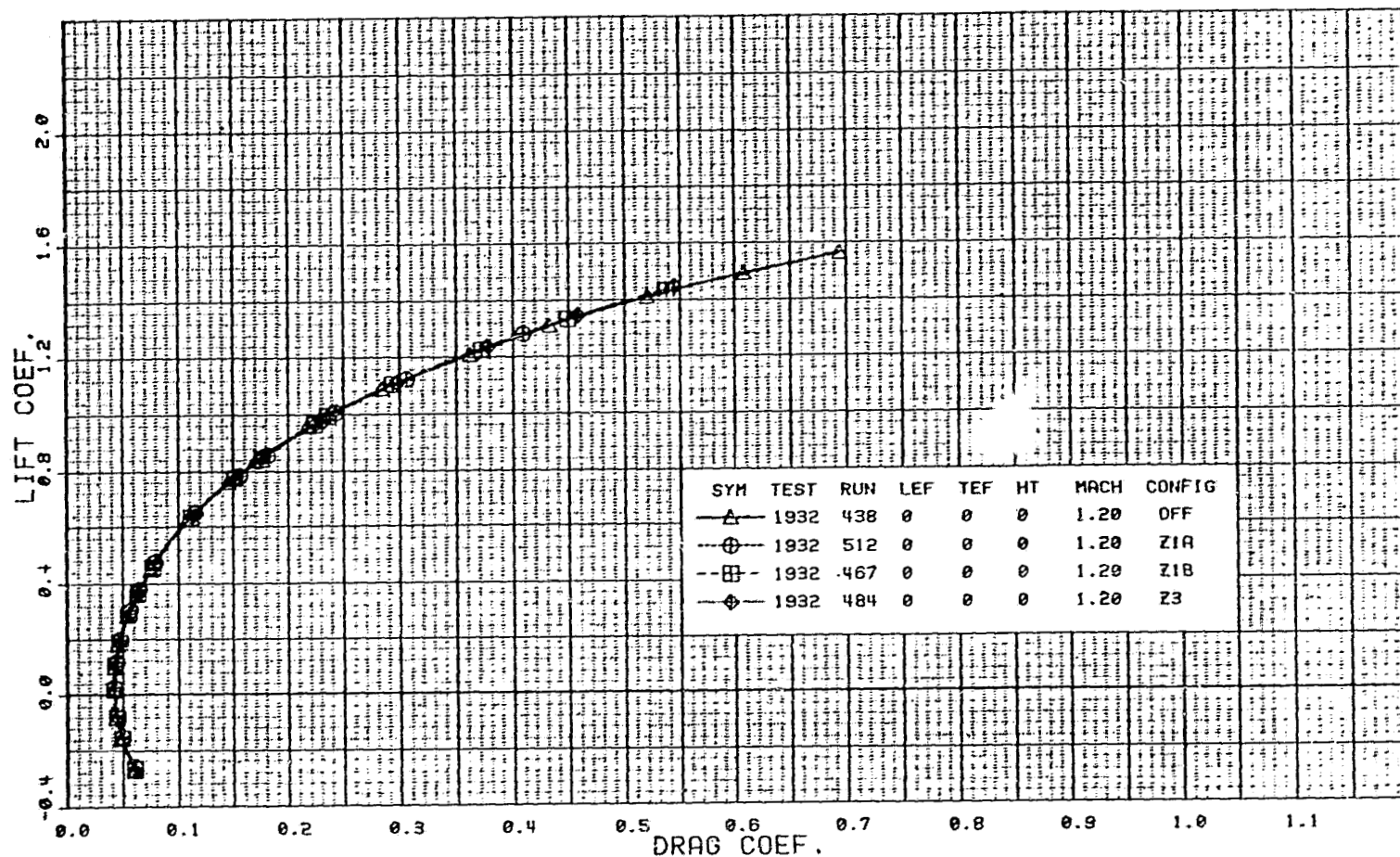


Figure 3-13 (b) Drag, Large Scale

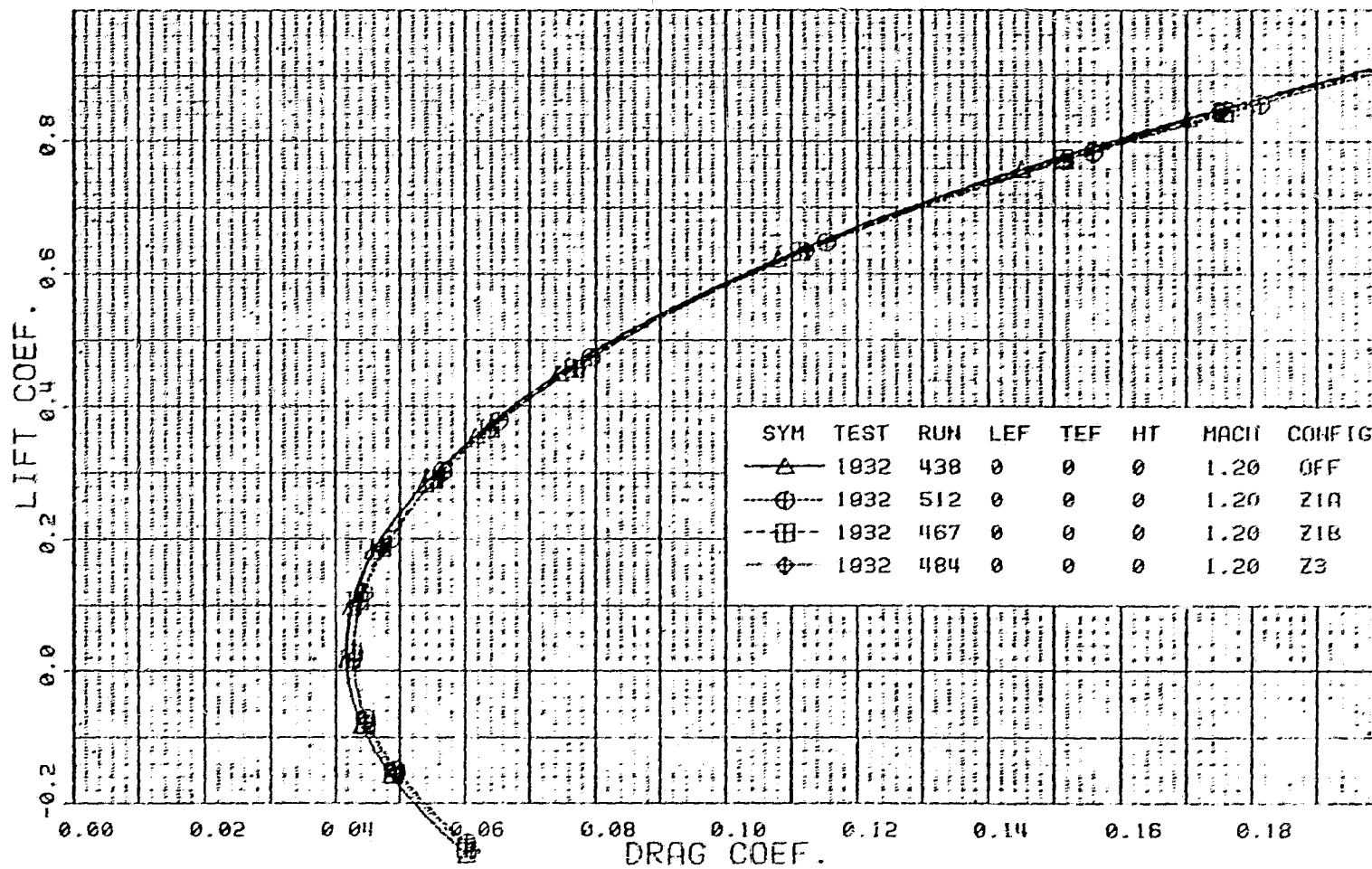


Figure 3-13 (c) Drag, Small Scale

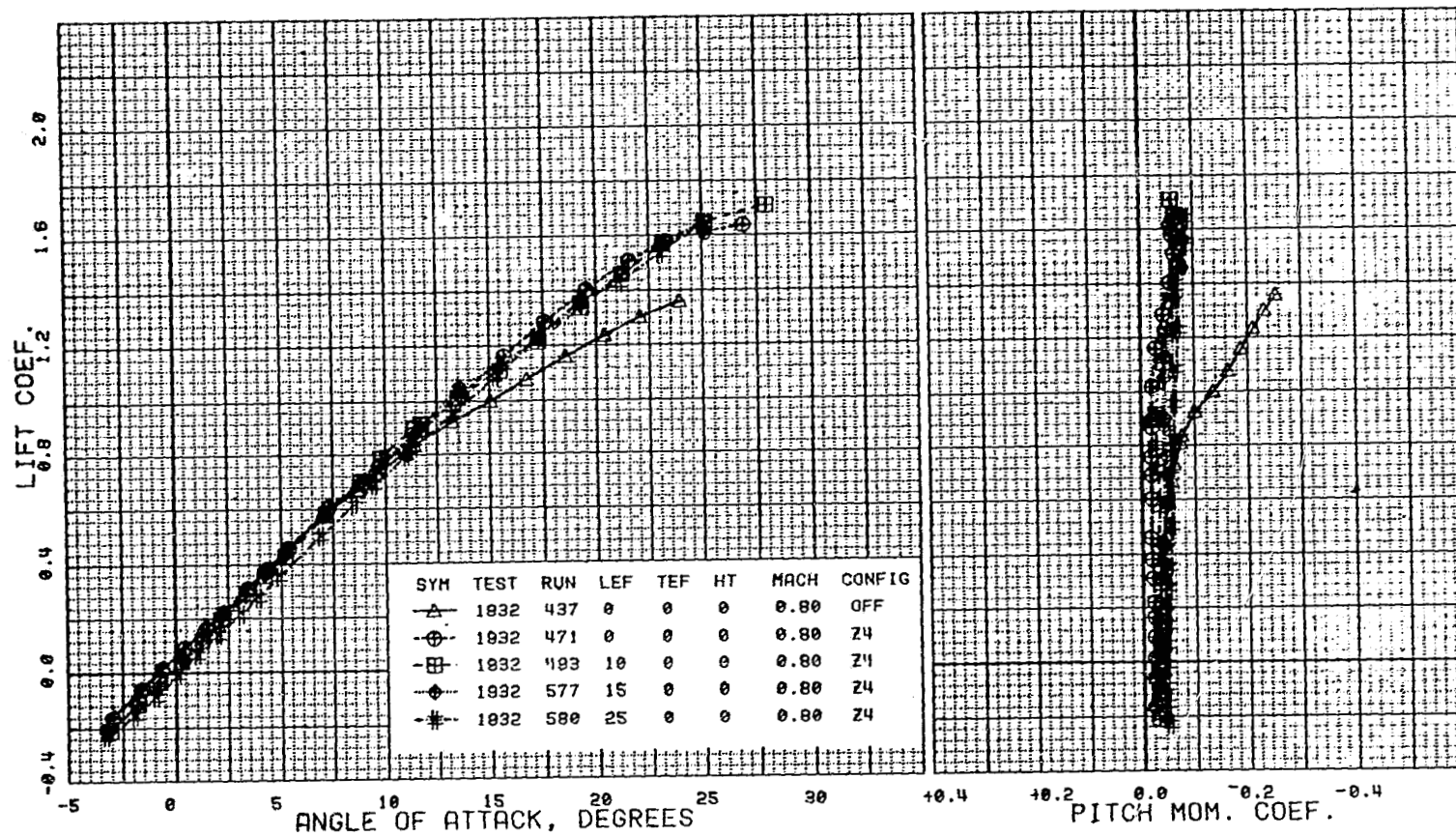


Figure 3-14 Effect of Leading Edge Flap Deflection with Forebody Strake Z4, Configuration 401F-5, $M = 0.80$
(a) Lift and Pitching Moment

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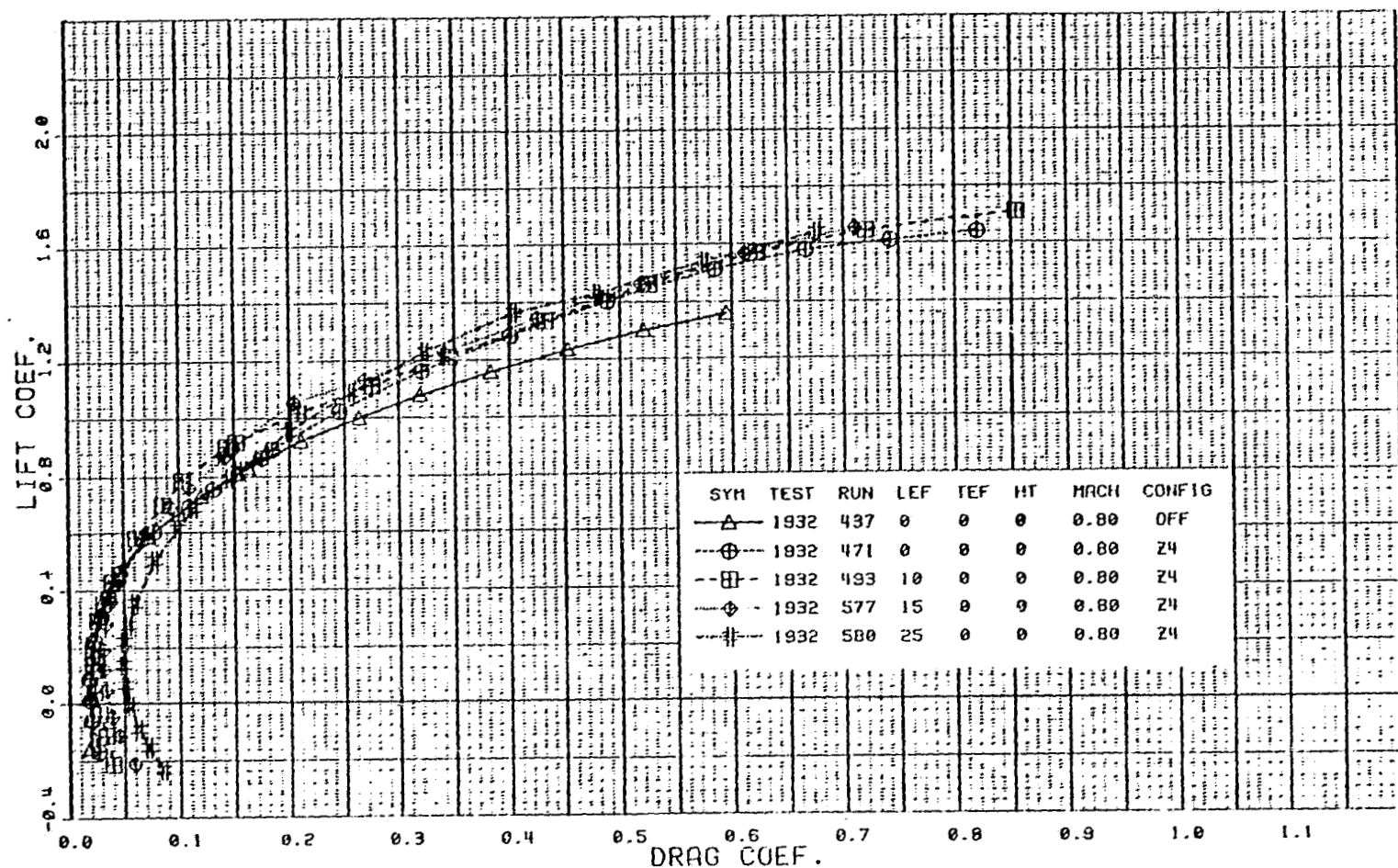
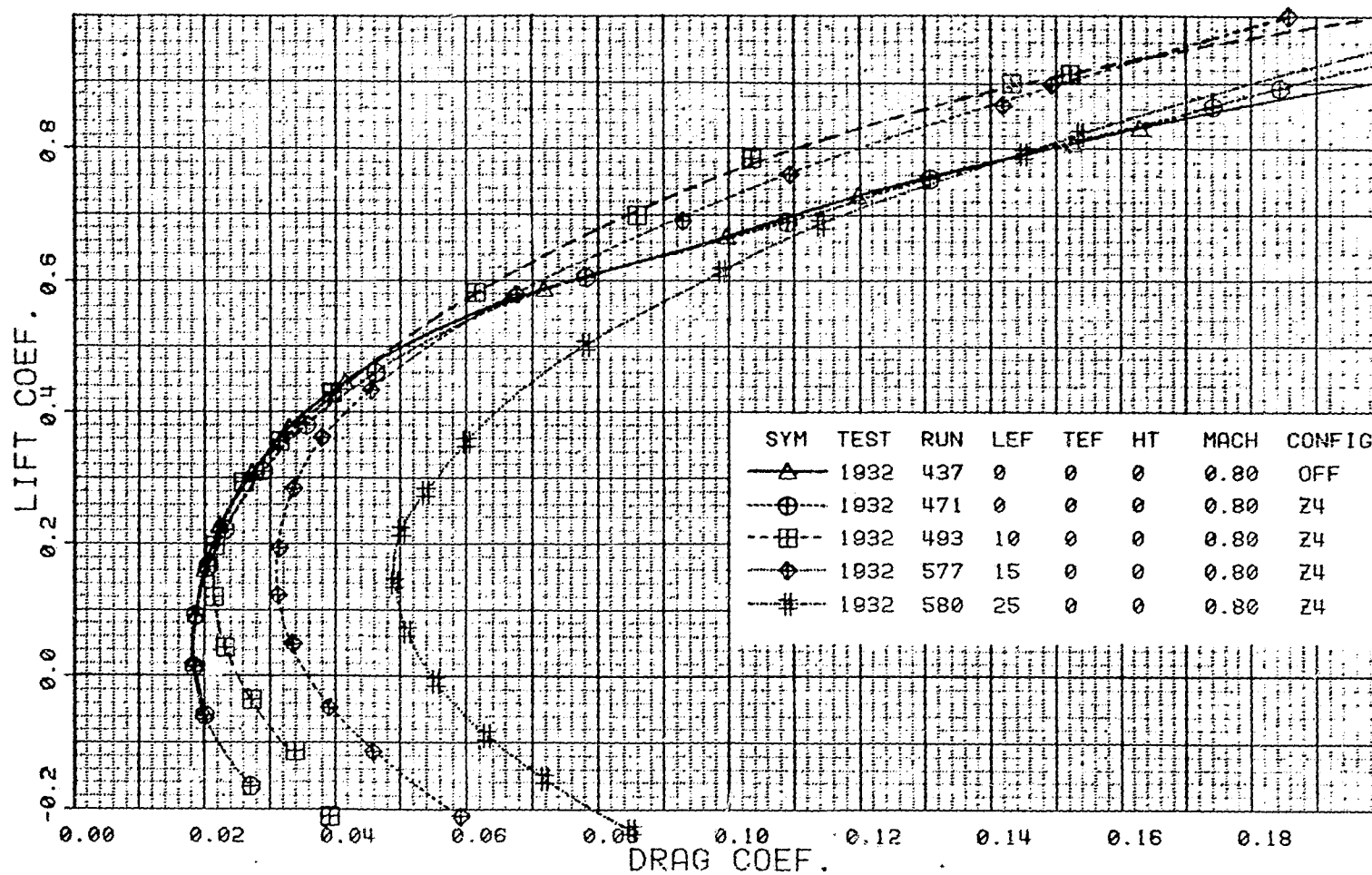


Figure 3-14 (b) Drag, Large Scale



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Figure 3-14 (c) Drag, Small Scale

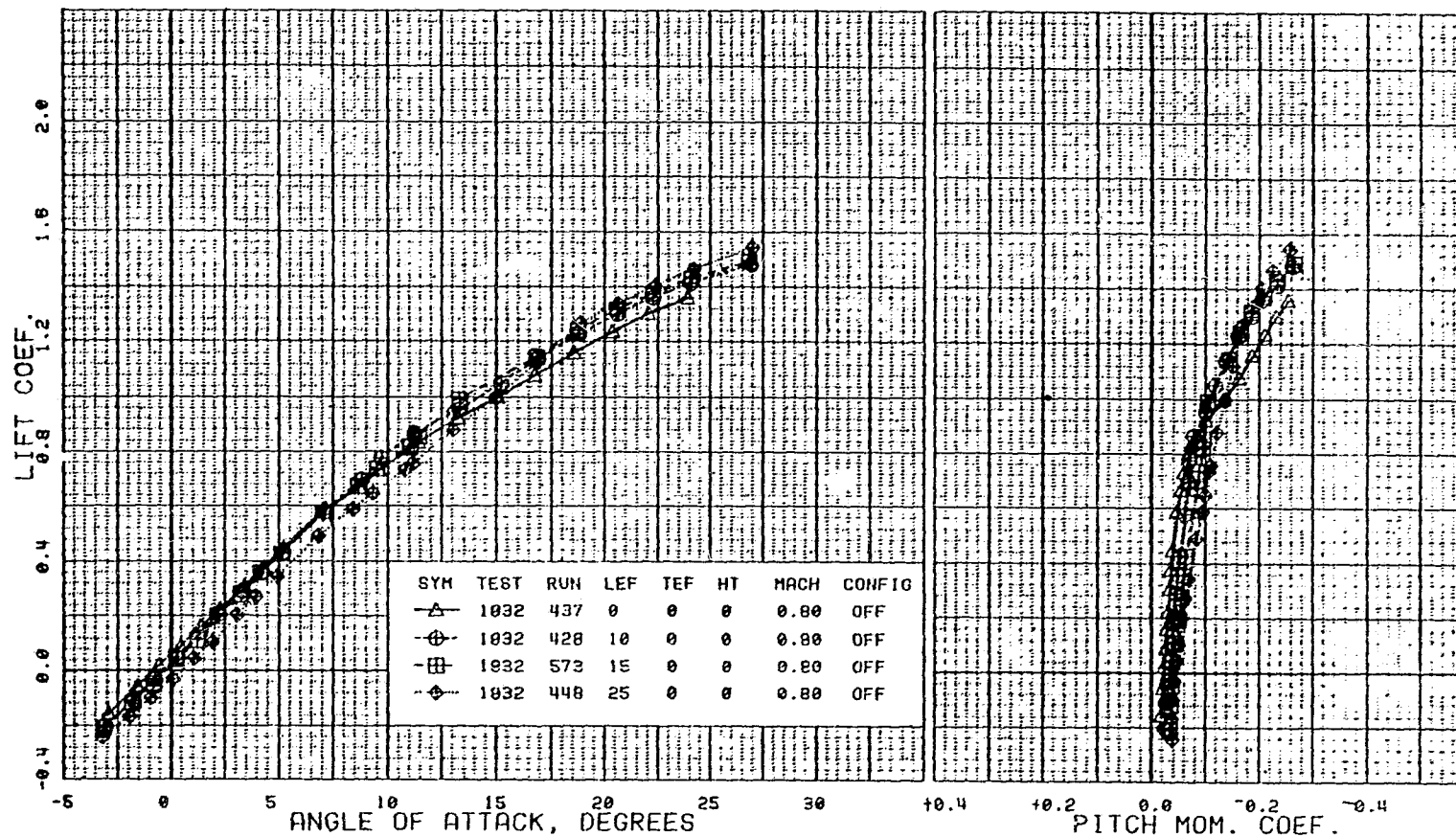


Figure 3-15 Effect of Leading Edge Flap Deflection Without a Strake,
Configuration 401F-5, $M = 0.80$
(a) Lift and Pitching Moment

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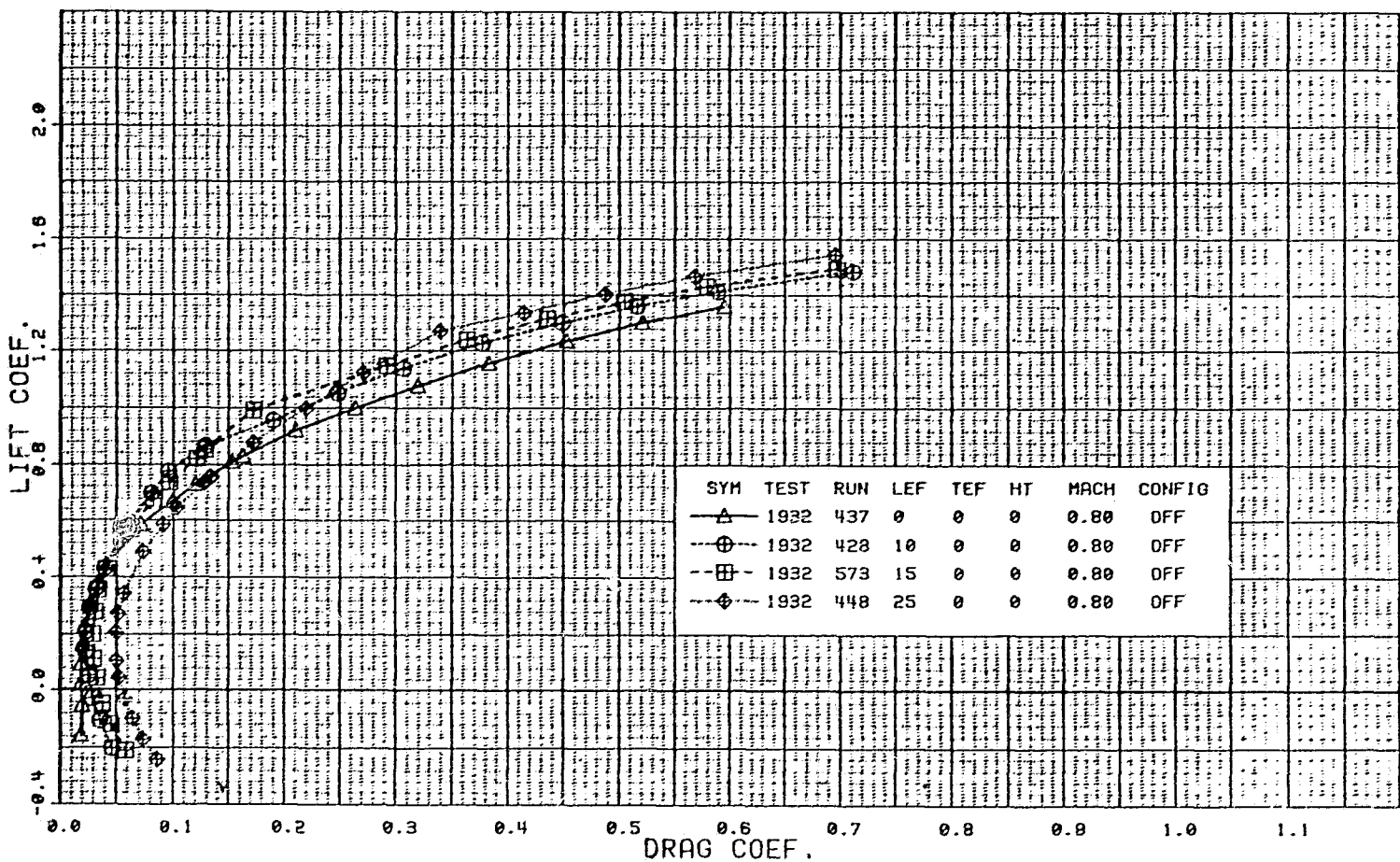


Figure 3-15 (b) Drag, Large Scale

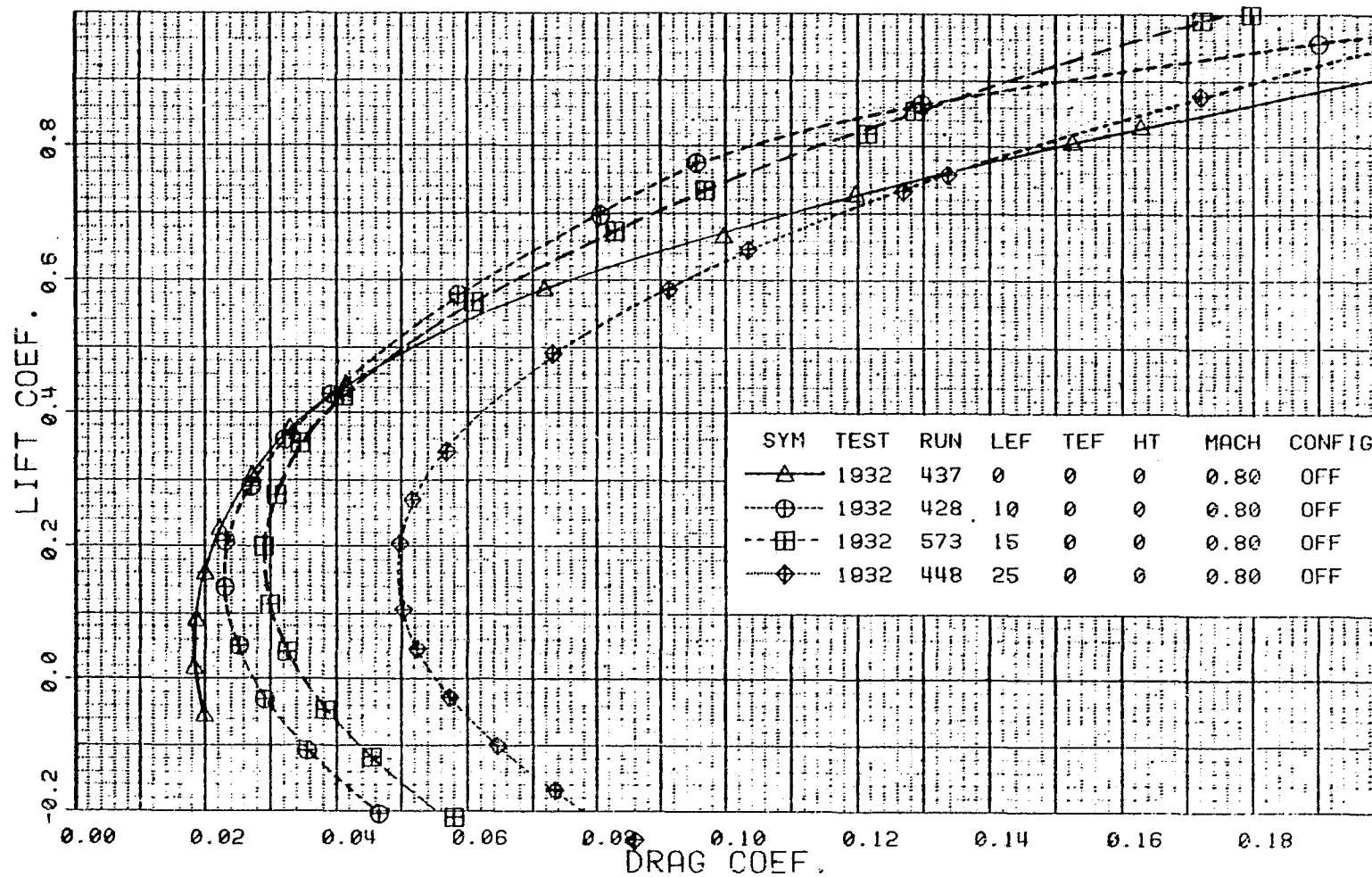


Figure 3-15 (c) Drag, Small Scale

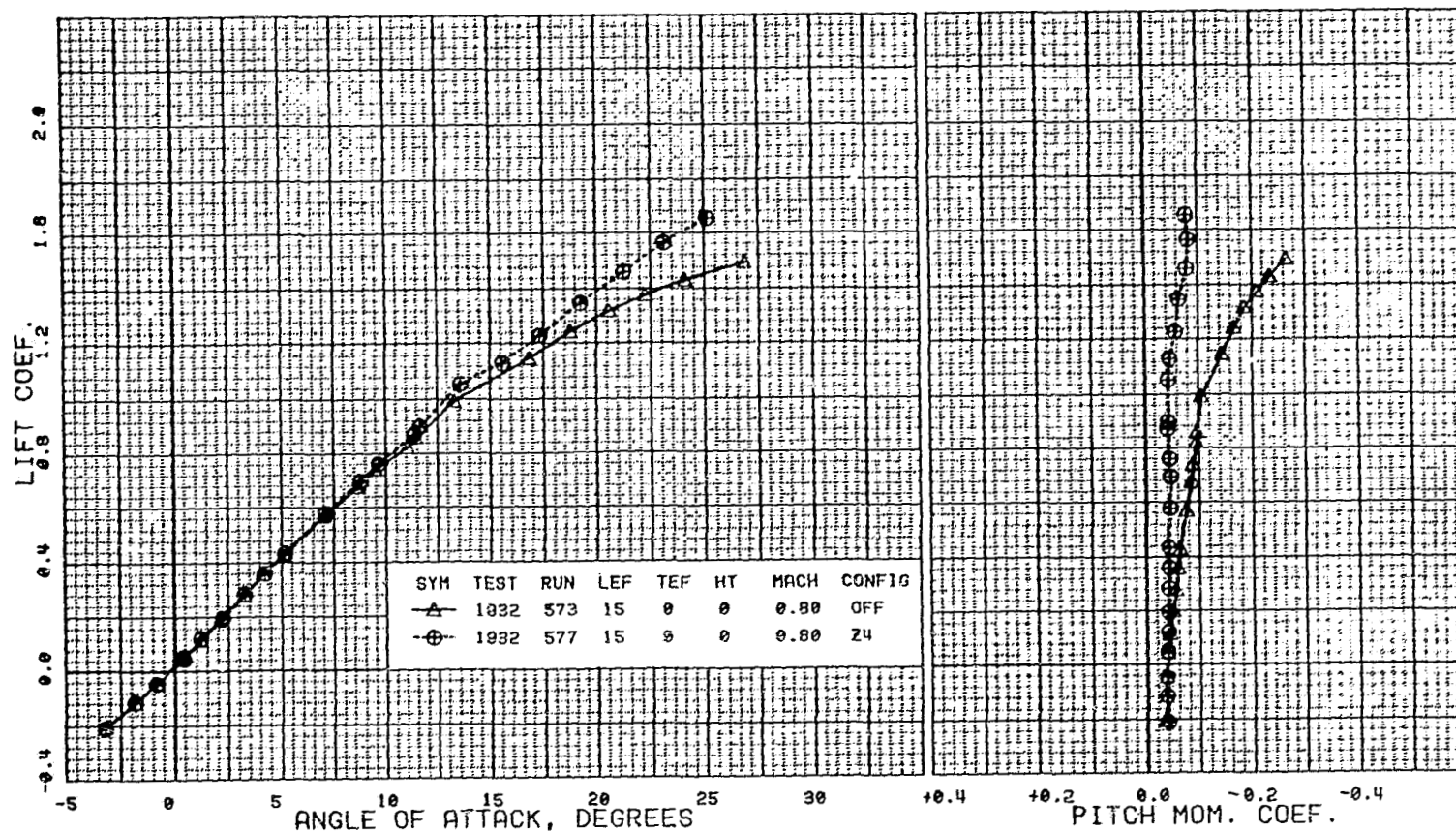


Figure 3-16 Effect of Forebody Strake Z4, Configuration 401F-5,
 LEF = 15° , M = 0.80
 (a) Lift and Pitching Moment

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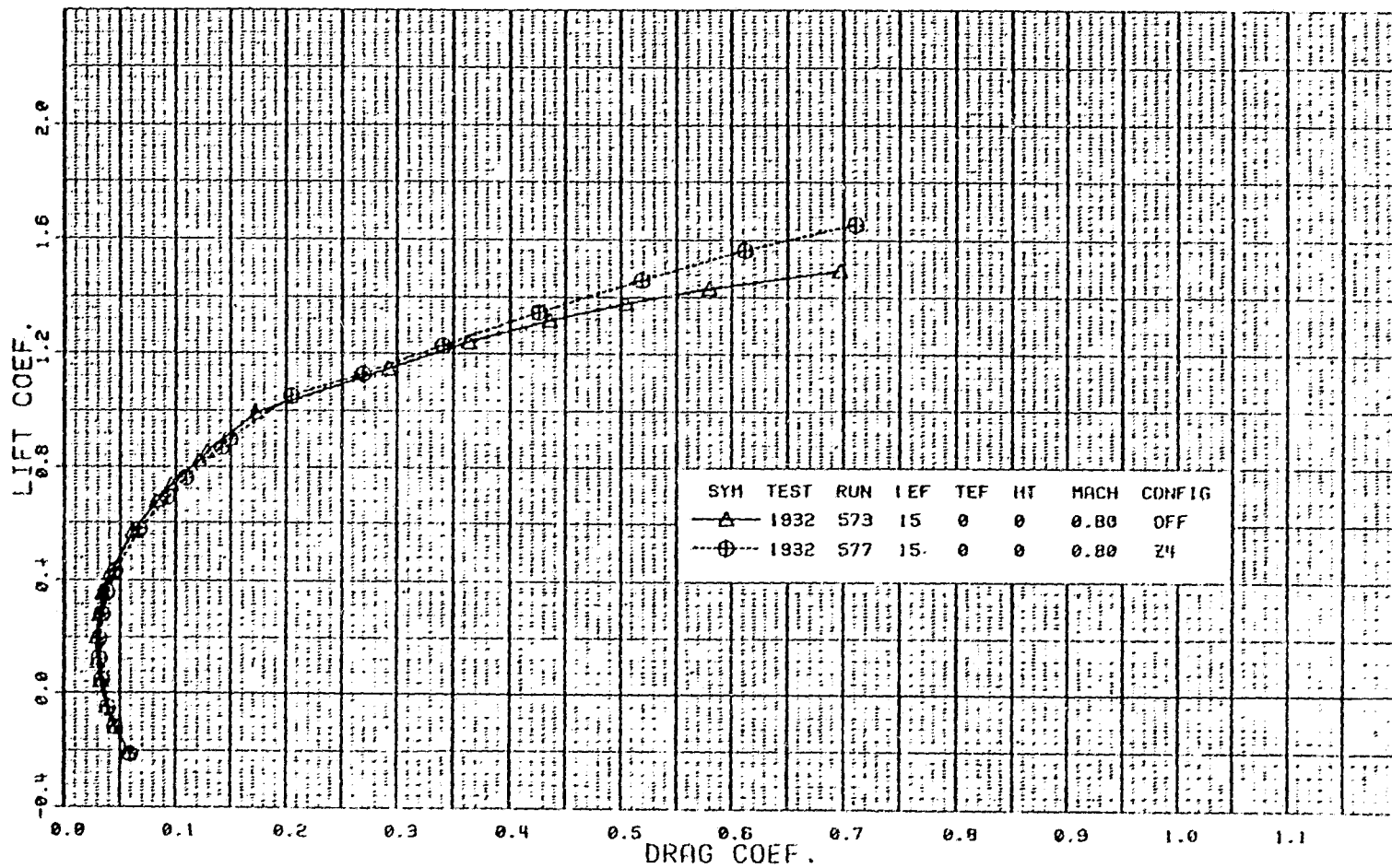


Figure 3-16 (b) Drag, Large Scale

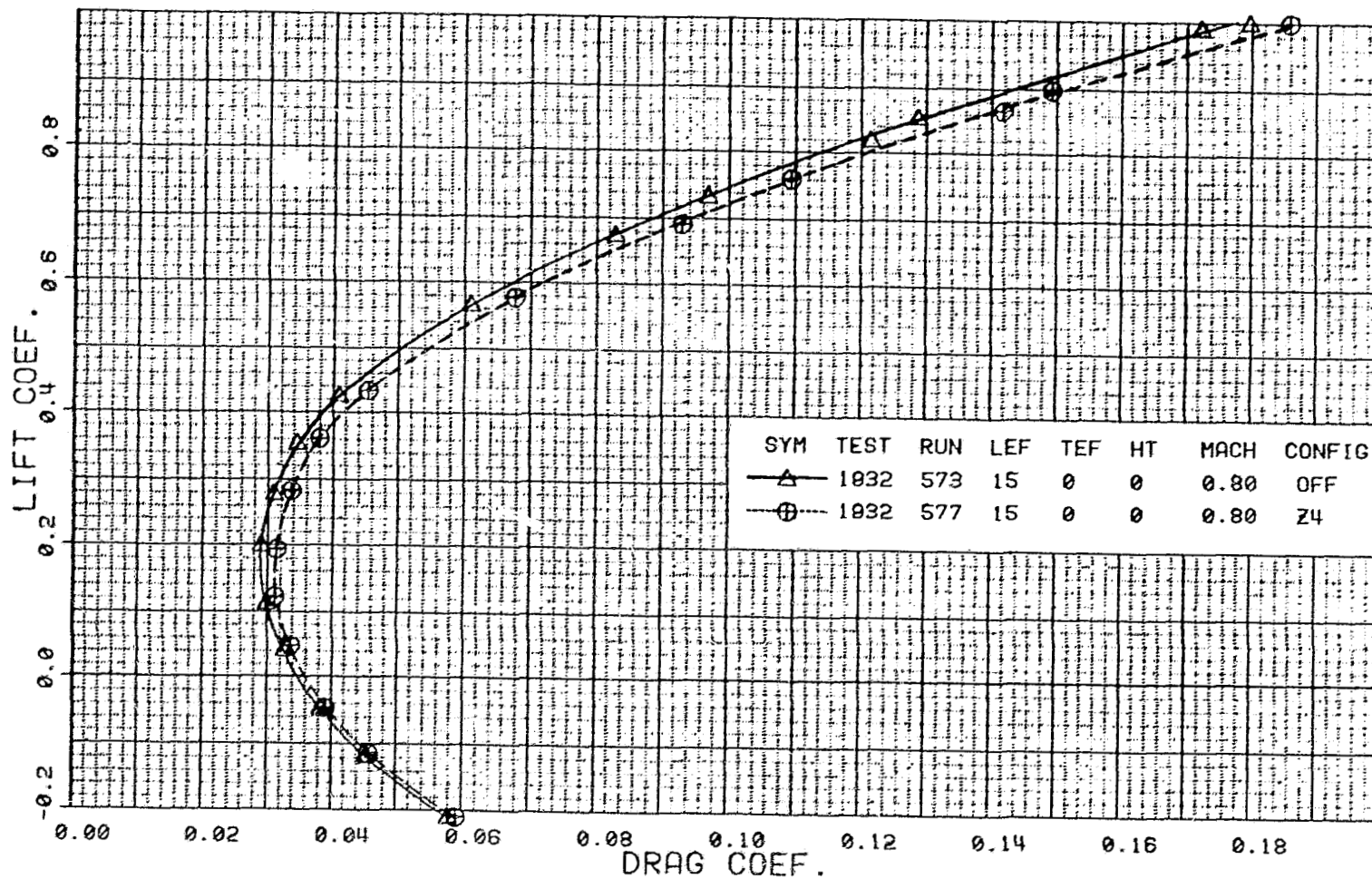


Figure 3-16 (c) Drag, Small Scale

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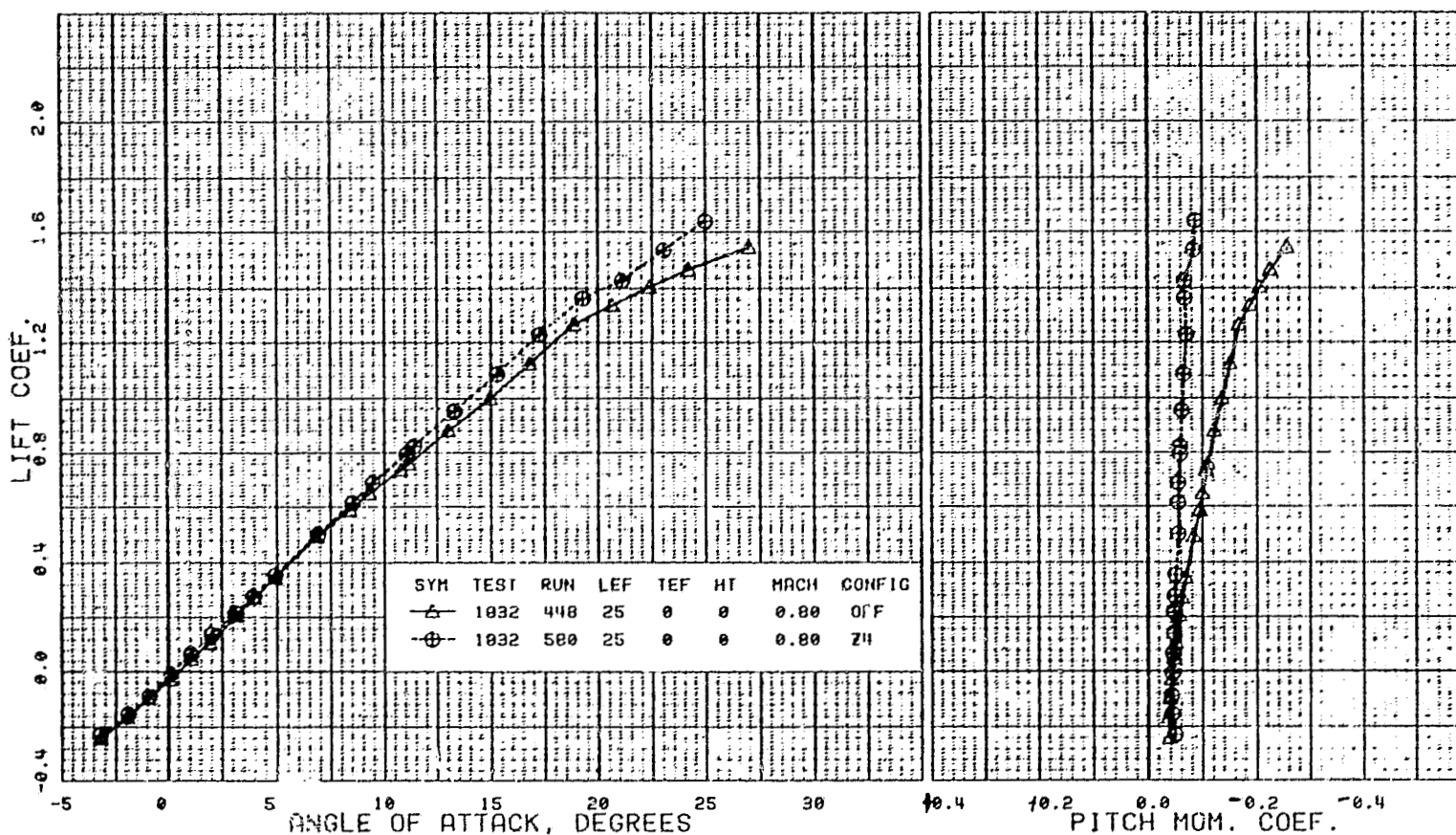


Figure 3-17 Effect of Forebody Strake Z4, Configuration 401F-5,
 LEF = 25°, M = 0.80
 (a) Lift and Pitching Moment

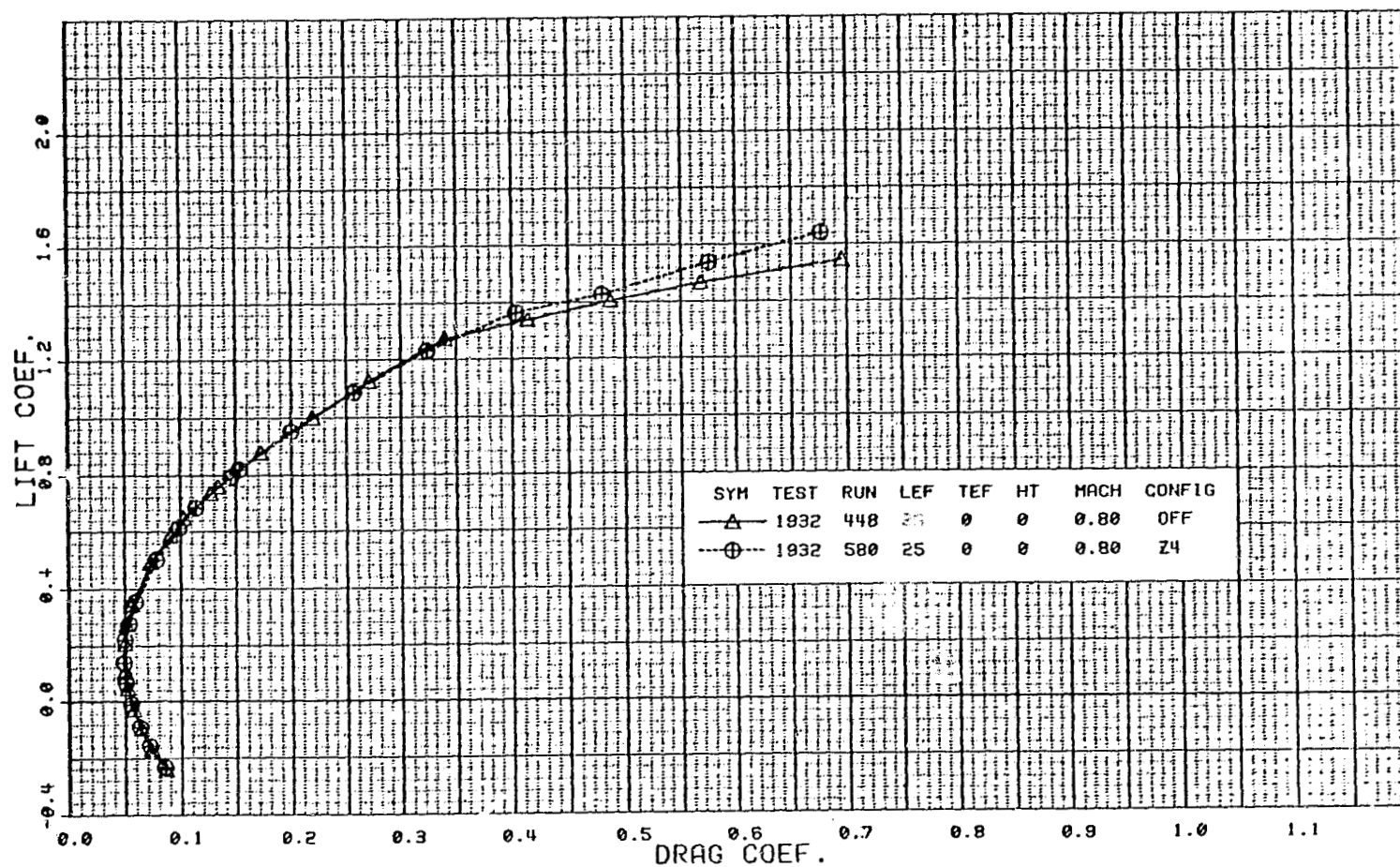


Figure 3-17 (b) Drag, Large Scale

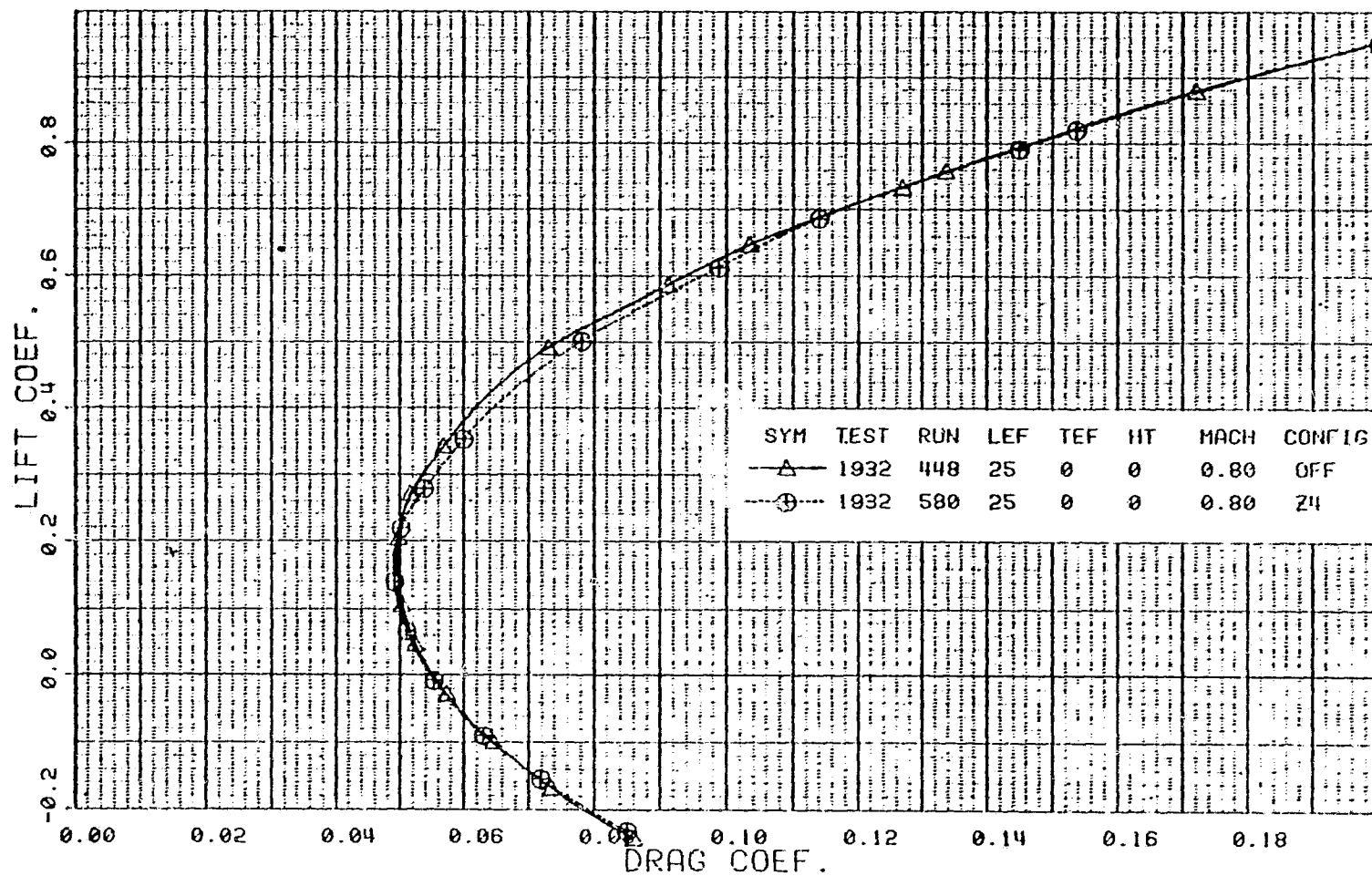


Figure 3-17 (c) Drag, Small Scale

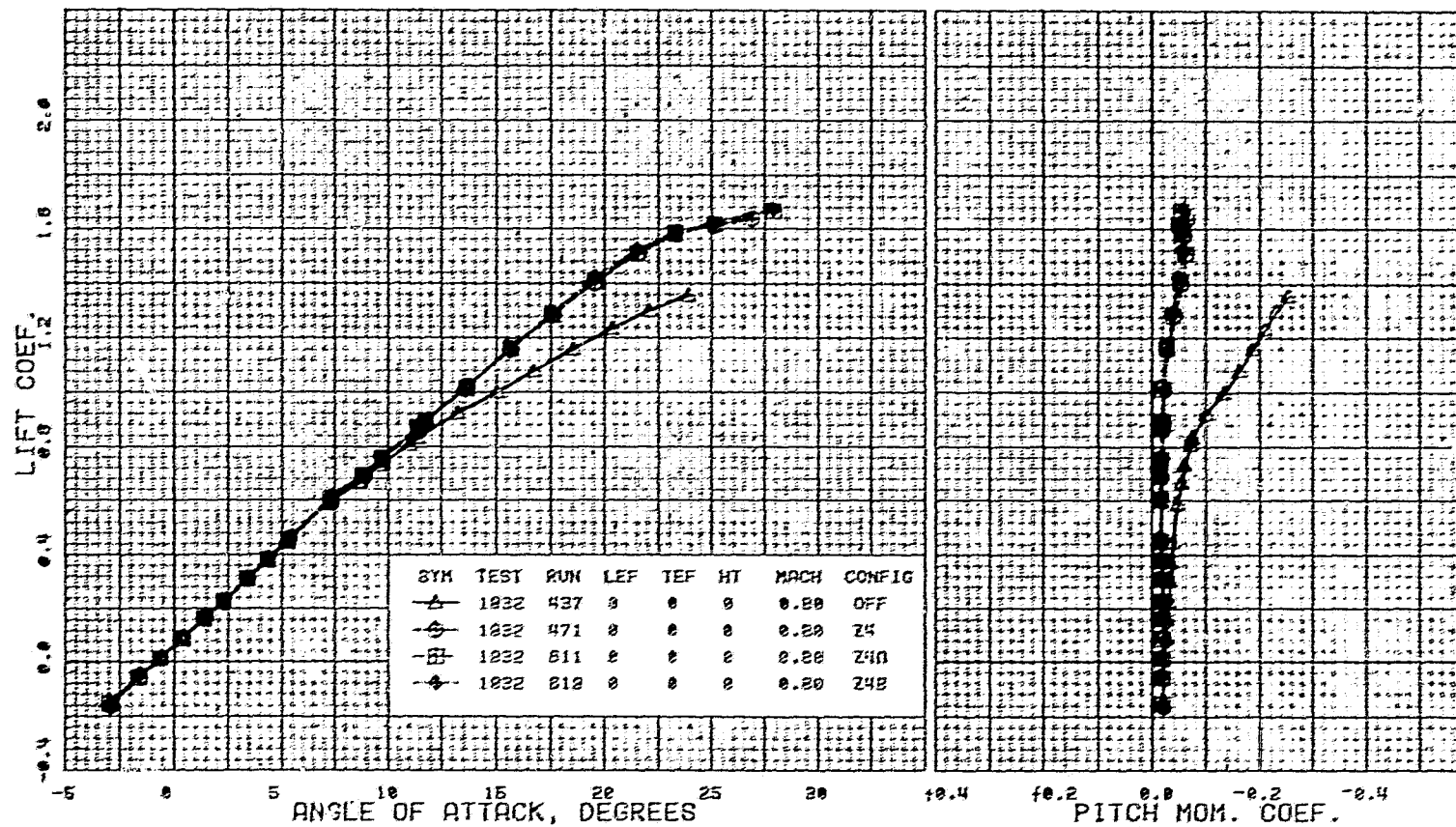


Figure 3-18 Effect of Forebody - Strake Blending (Z4), Configuration 401F-5, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

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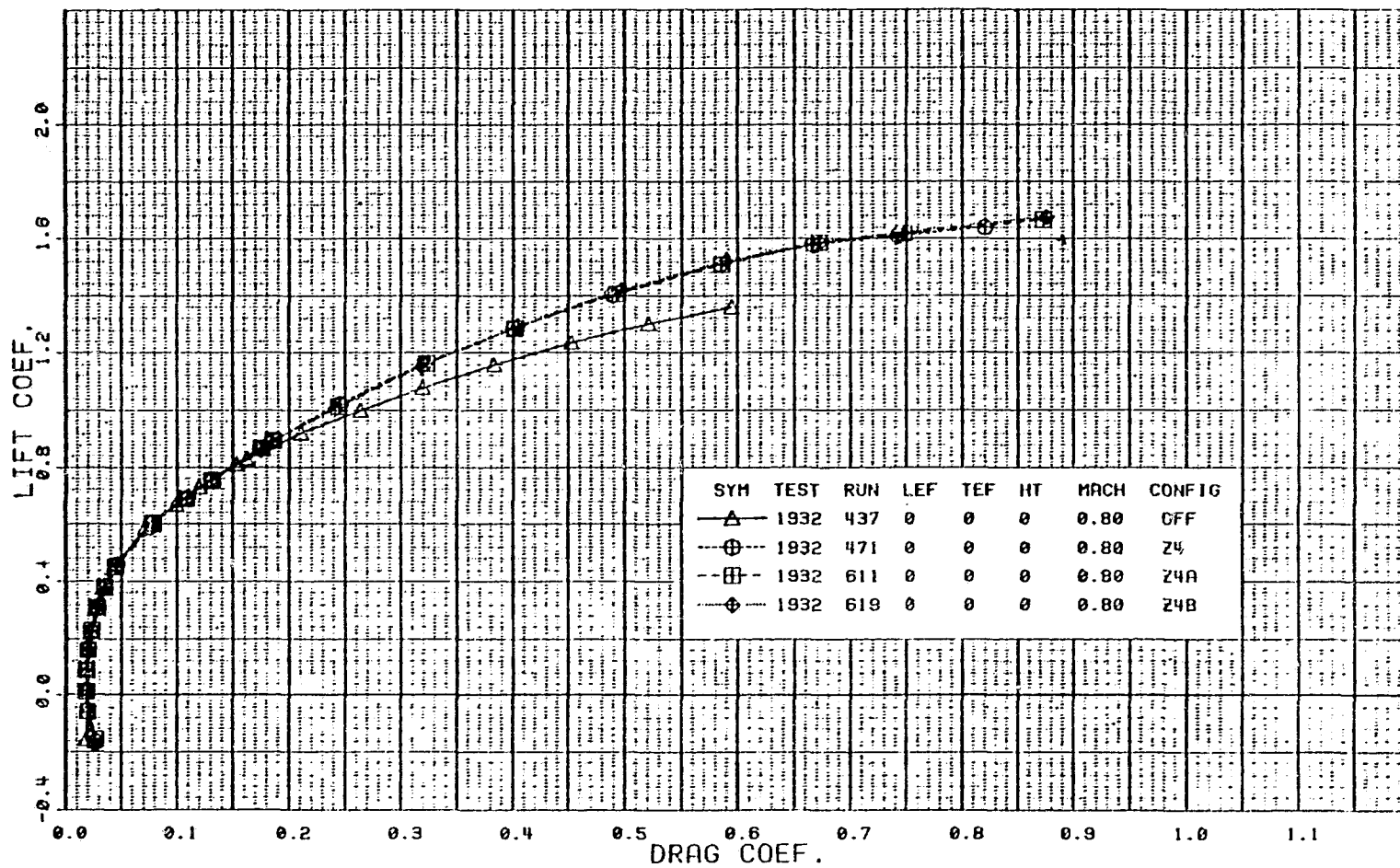


Figure 3-18 (b) Drag, Large Scale

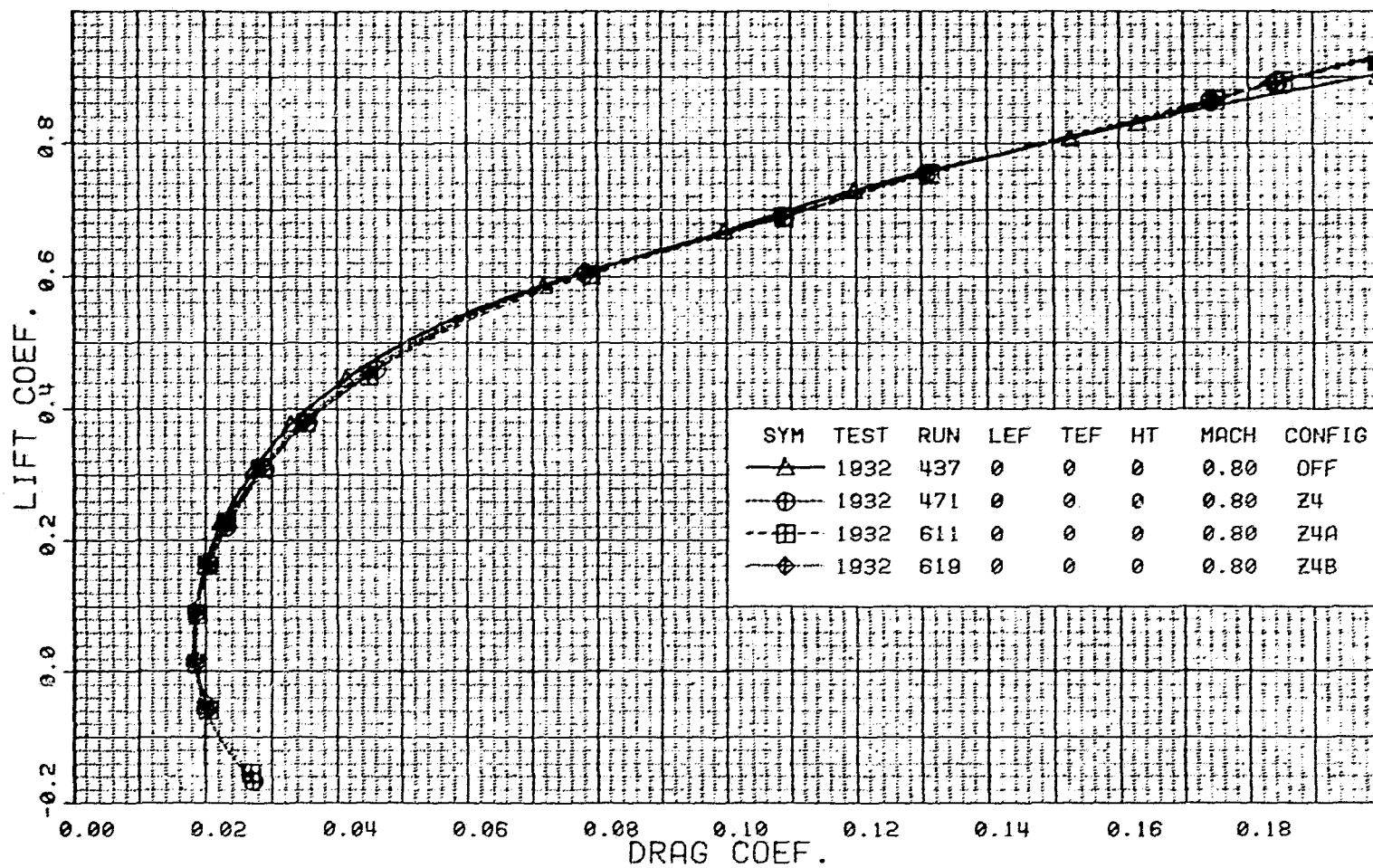


Figure 3-18 (c) Drag, Small Scale

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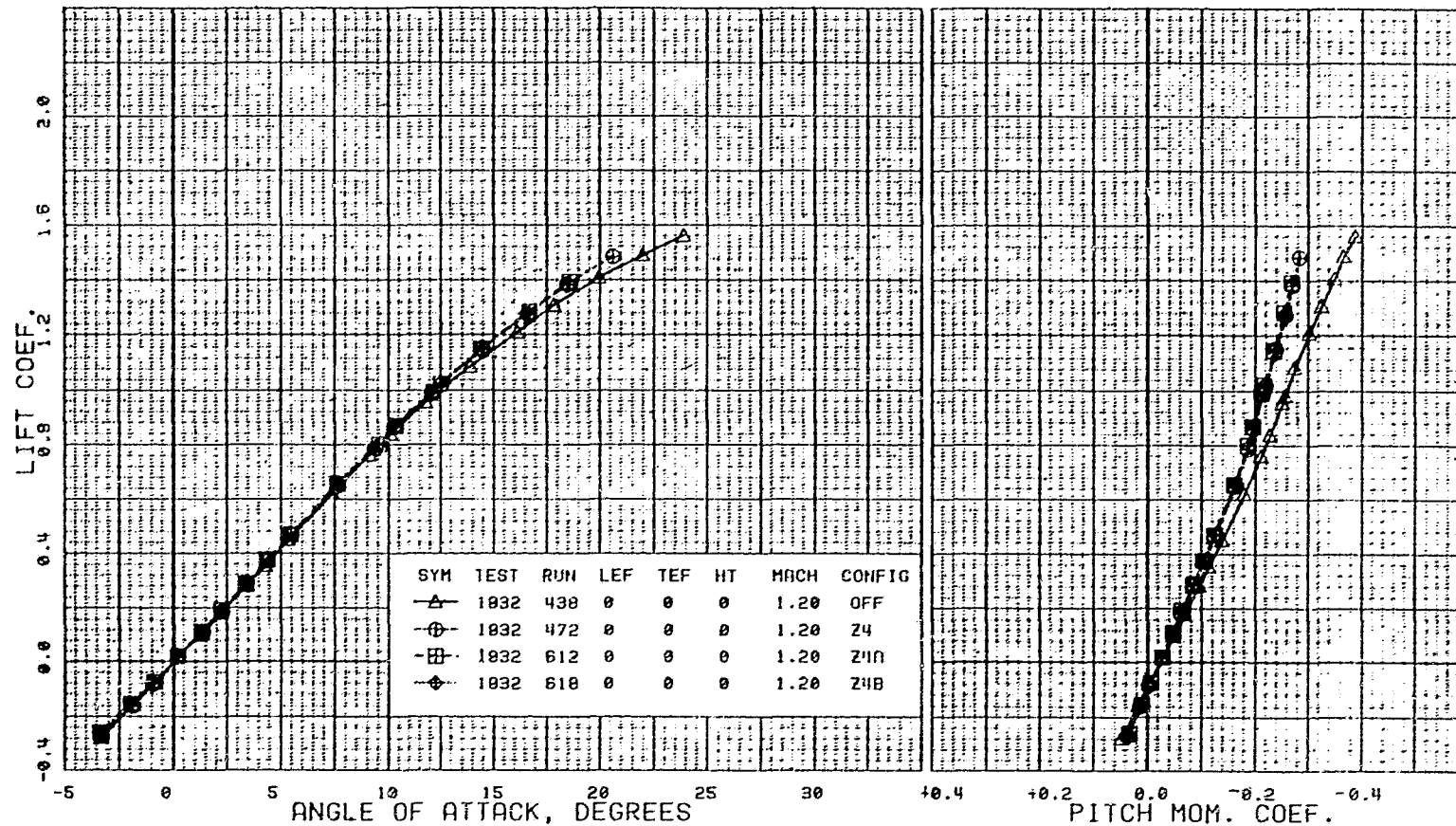


Figure 3-19 Effect of Forebody - Strake Blending (Z4), Configuration 401F-5, $M = 1.20$
(a) Lift and Pitching Moment

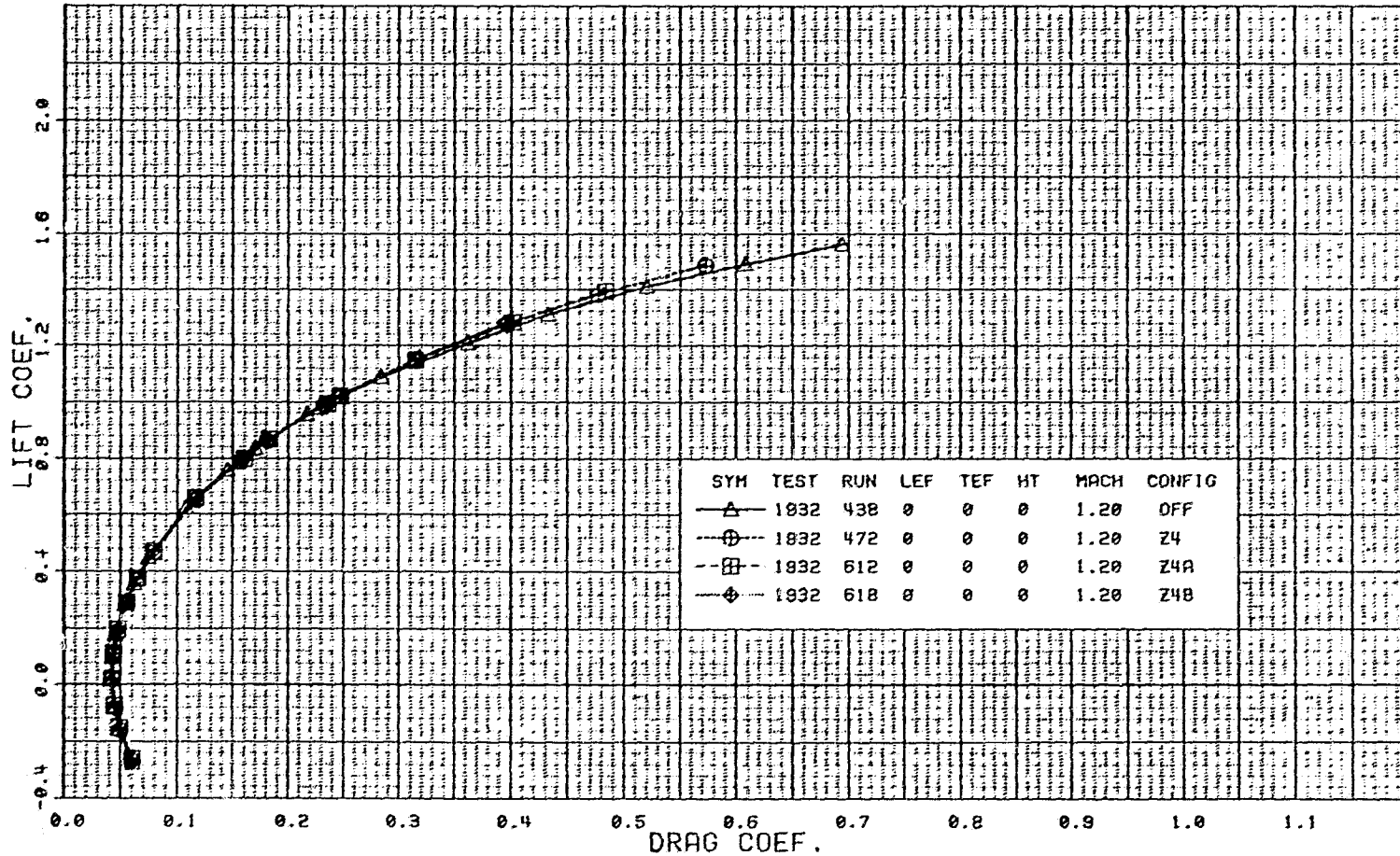


Figure 3-19 (b) Drag, Large Scale

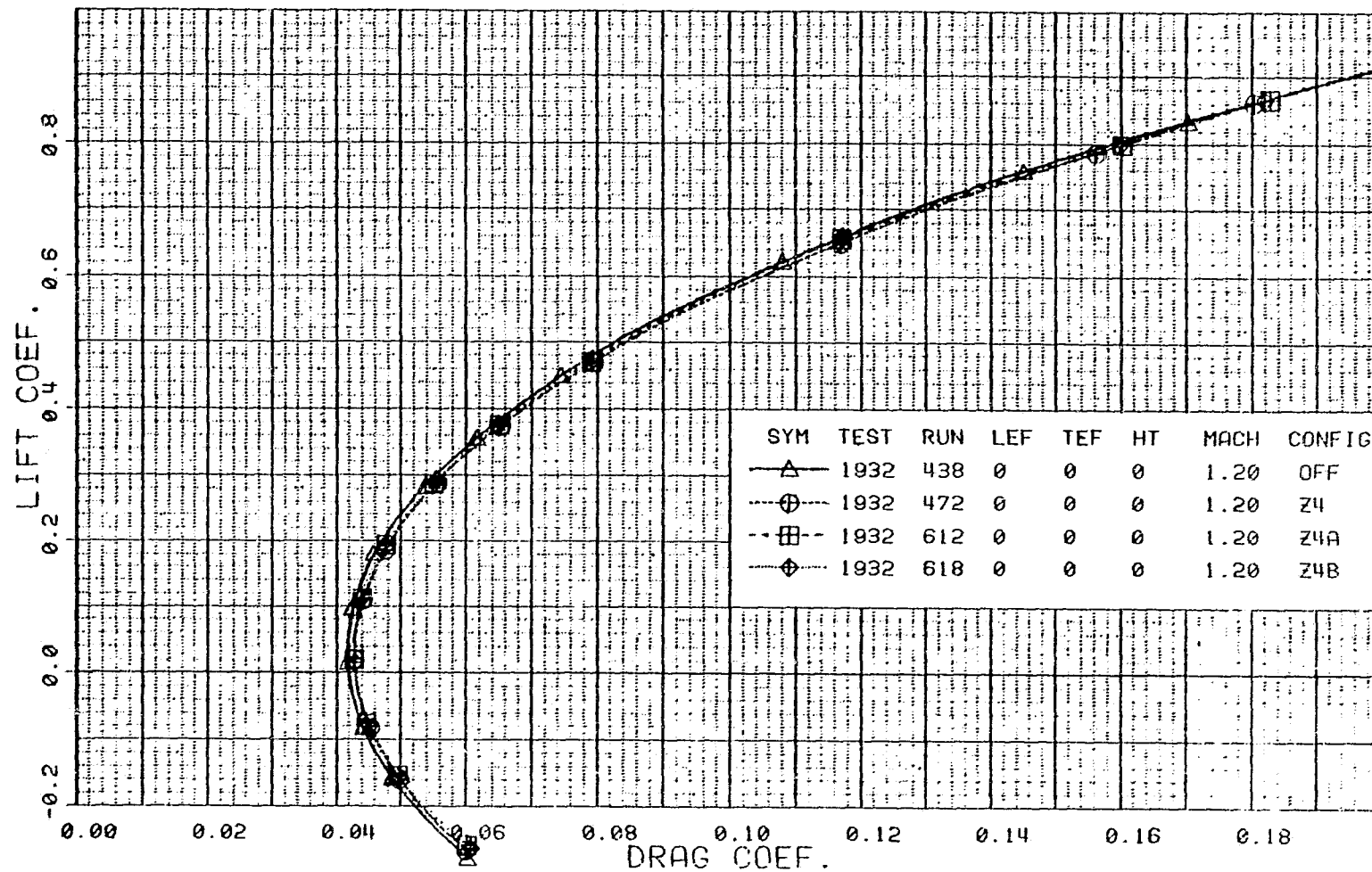


Figure 3-19 (c) Drag, Small Scale

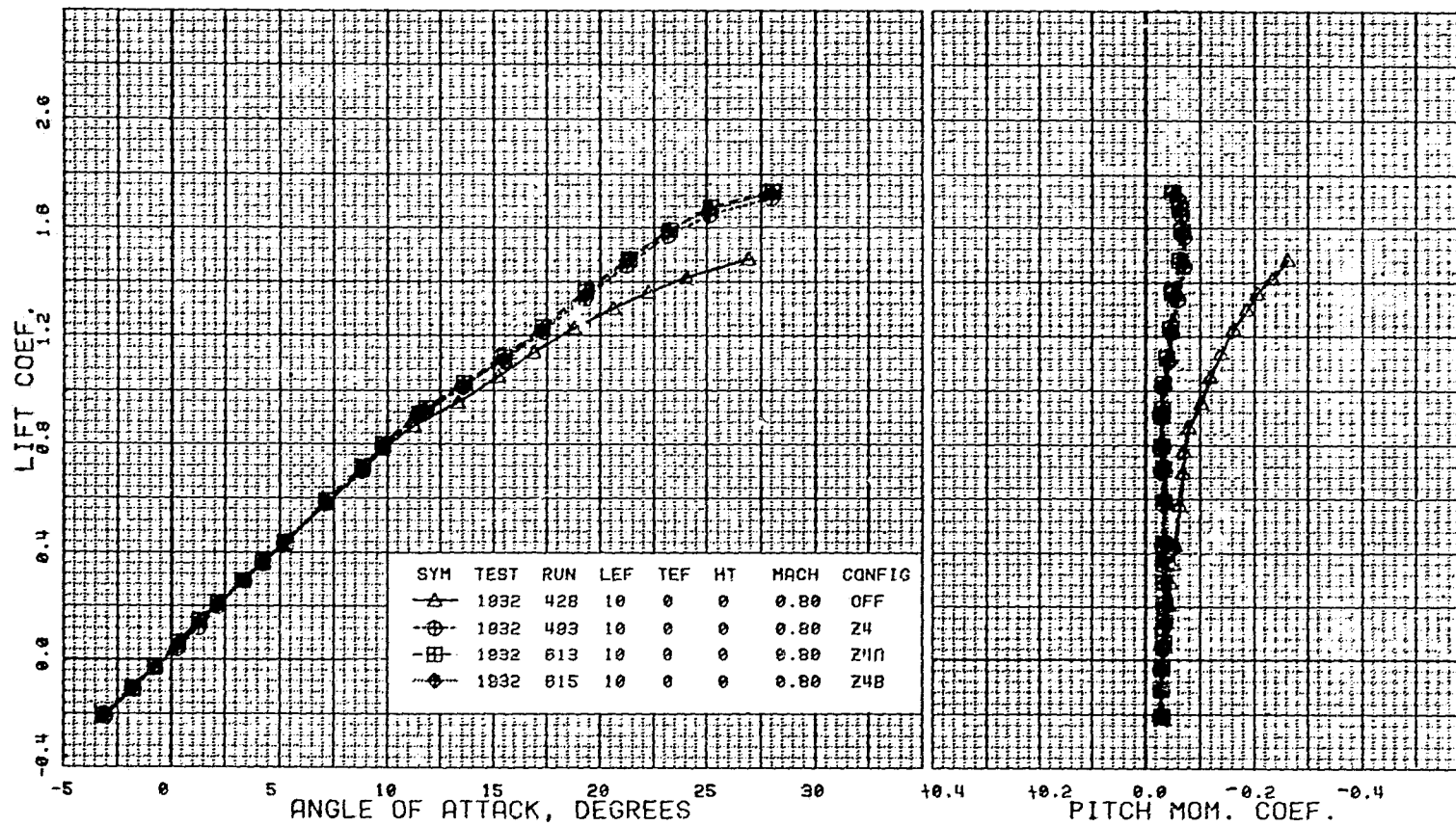


Figure 3-20 Effect of Forebody Strake Blending (Z4), Configuration 401F-5, LEF = 10°, M = 0.80
(a) Lift and Pitching Moment

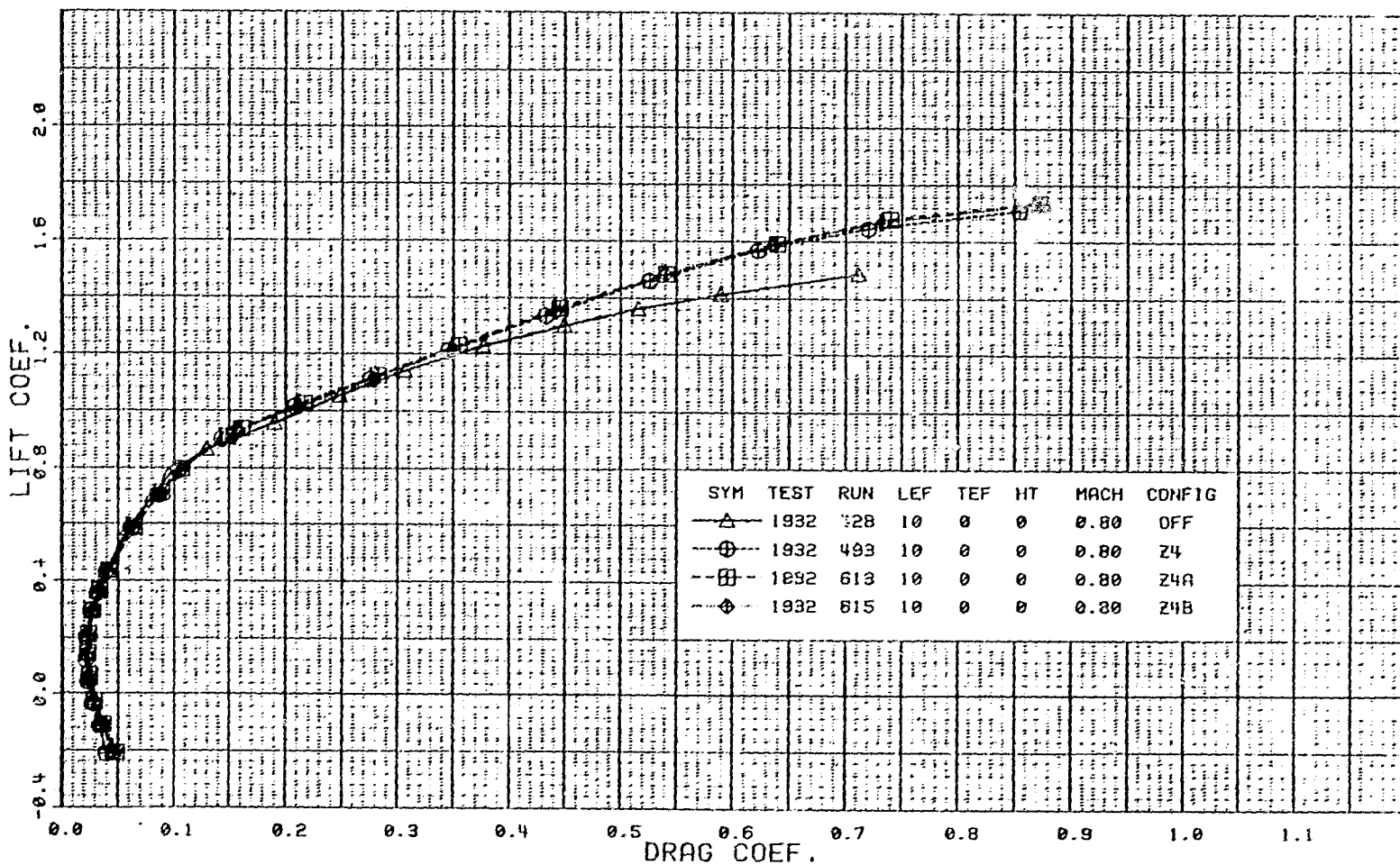


Figure 3-20 (b) Drag, Large Scale

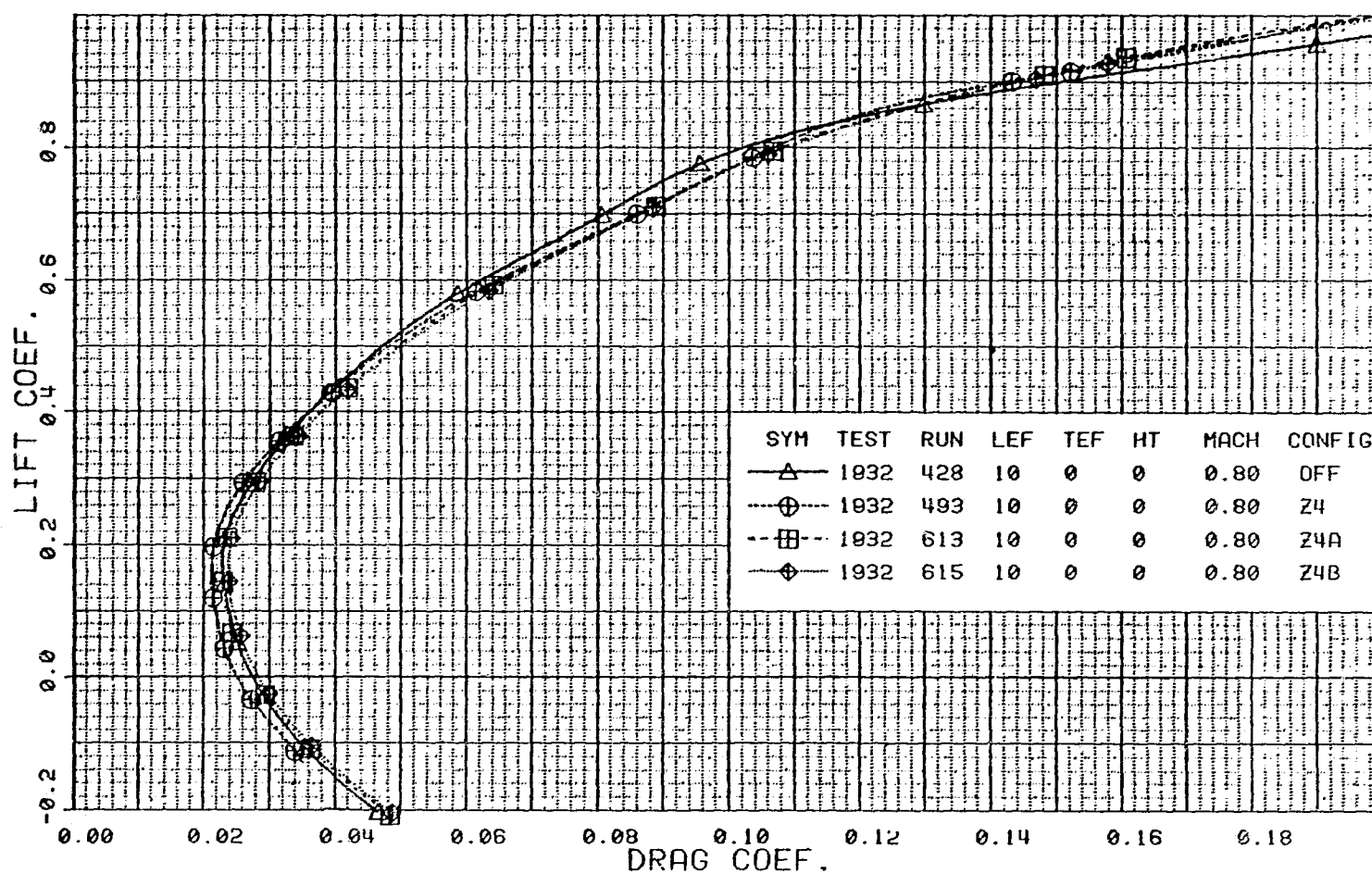


Figure 3-20 (c) Drag, Small Scale

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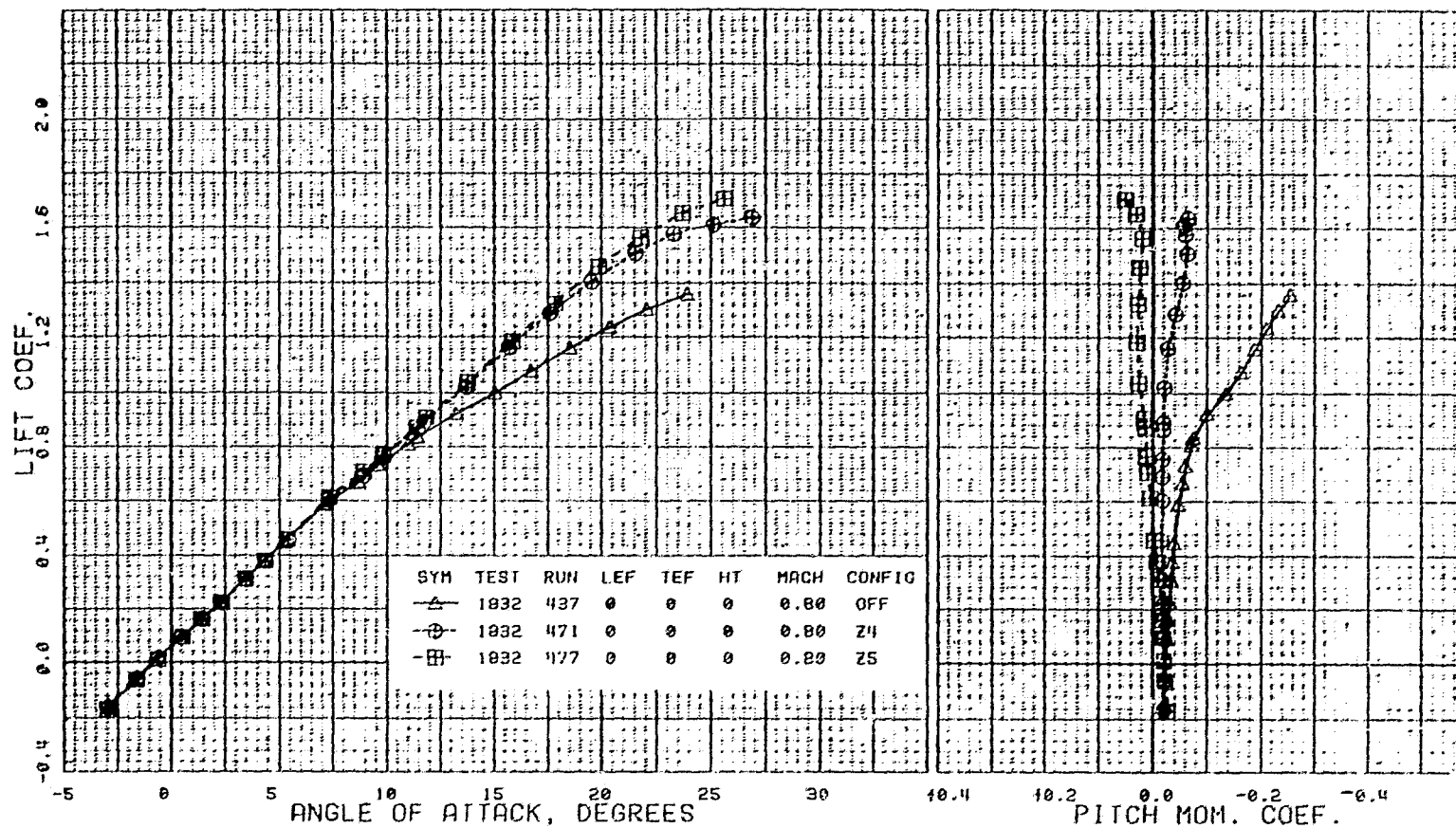


Figure 3-21 Effect of Forebody Strake Z4 and Z5, Configuration 401F-5, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

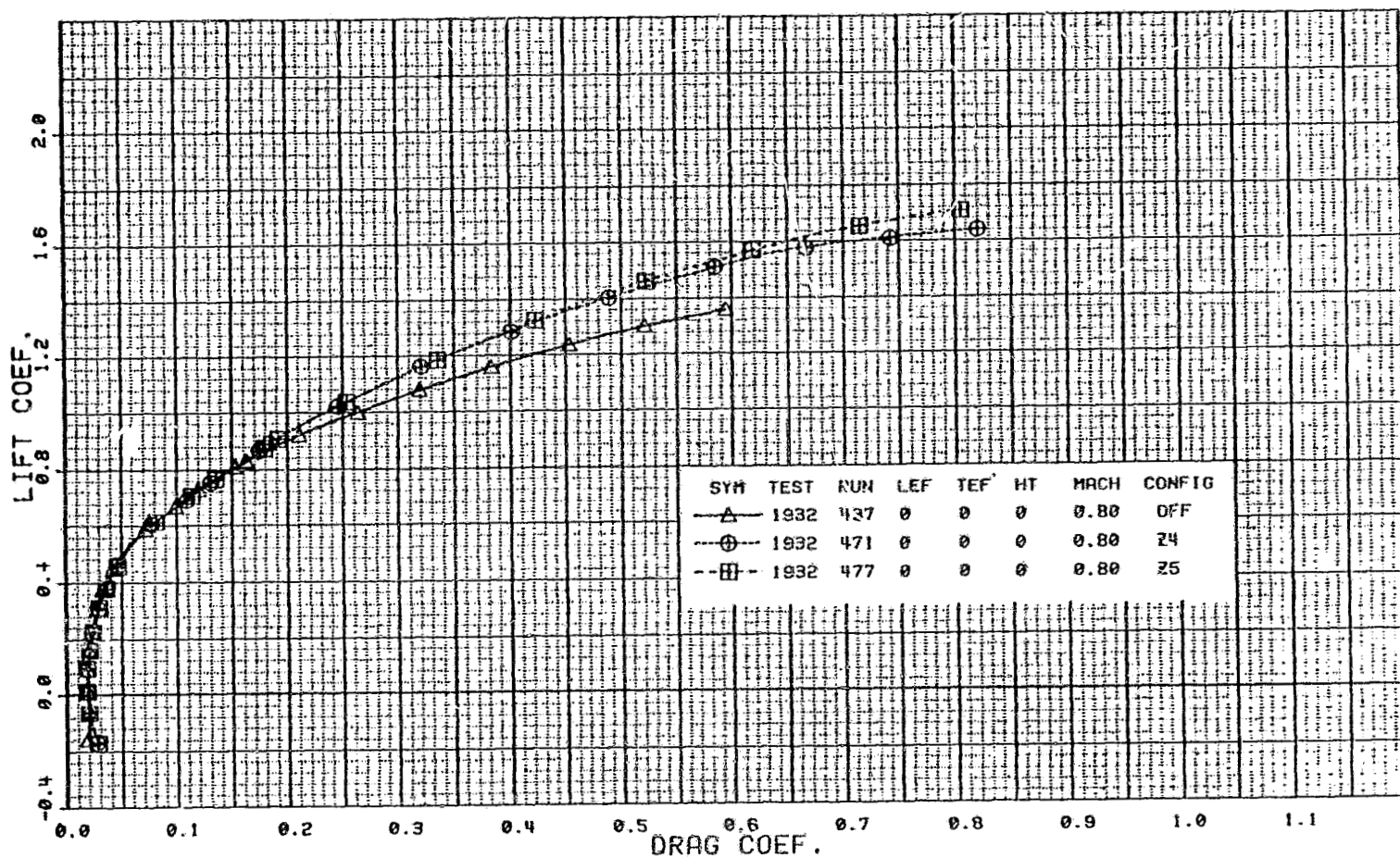


Figure 3-21 (b) Drag, Large Scale

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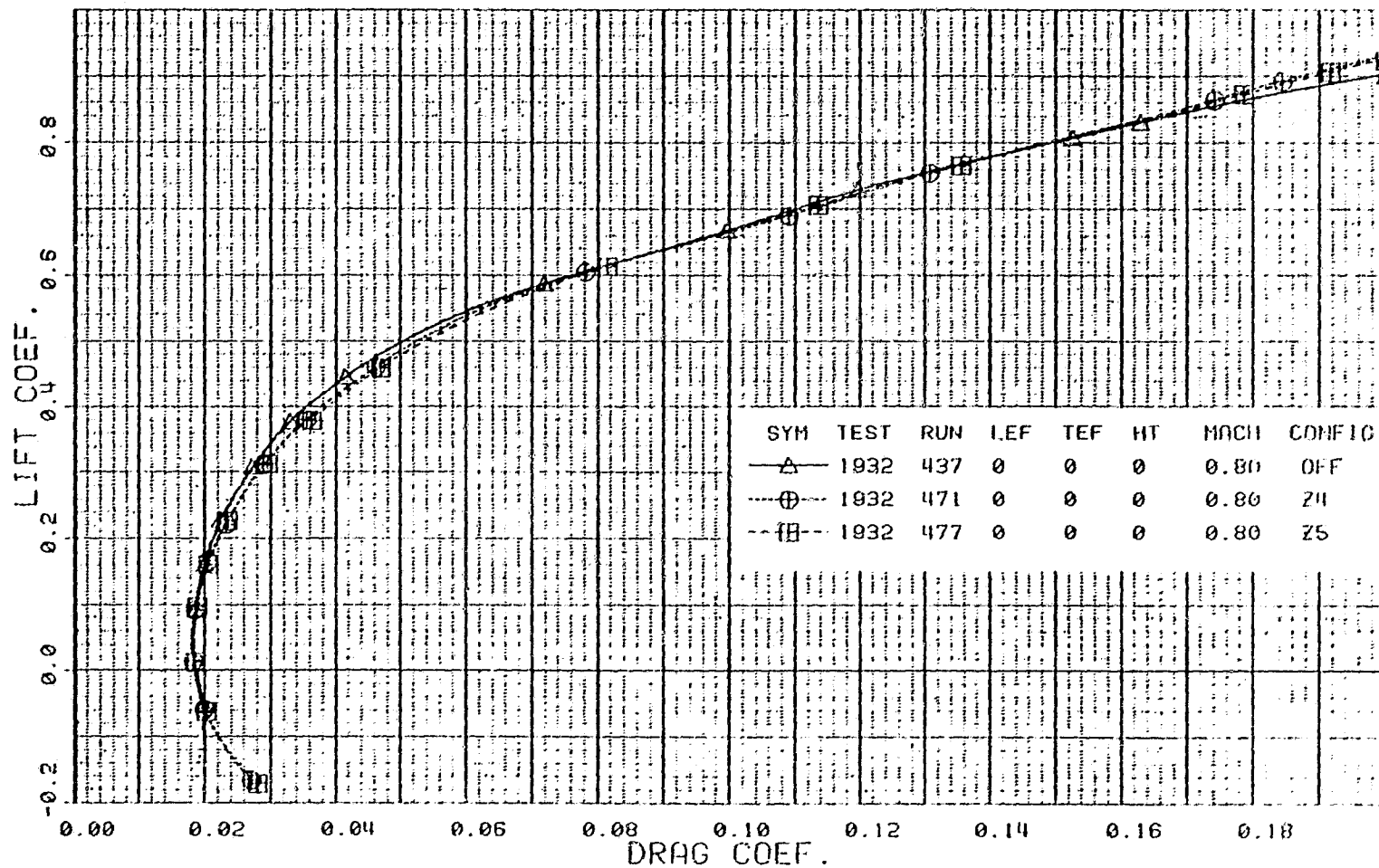


Figure 3-21 (c) Drag, Small Scale

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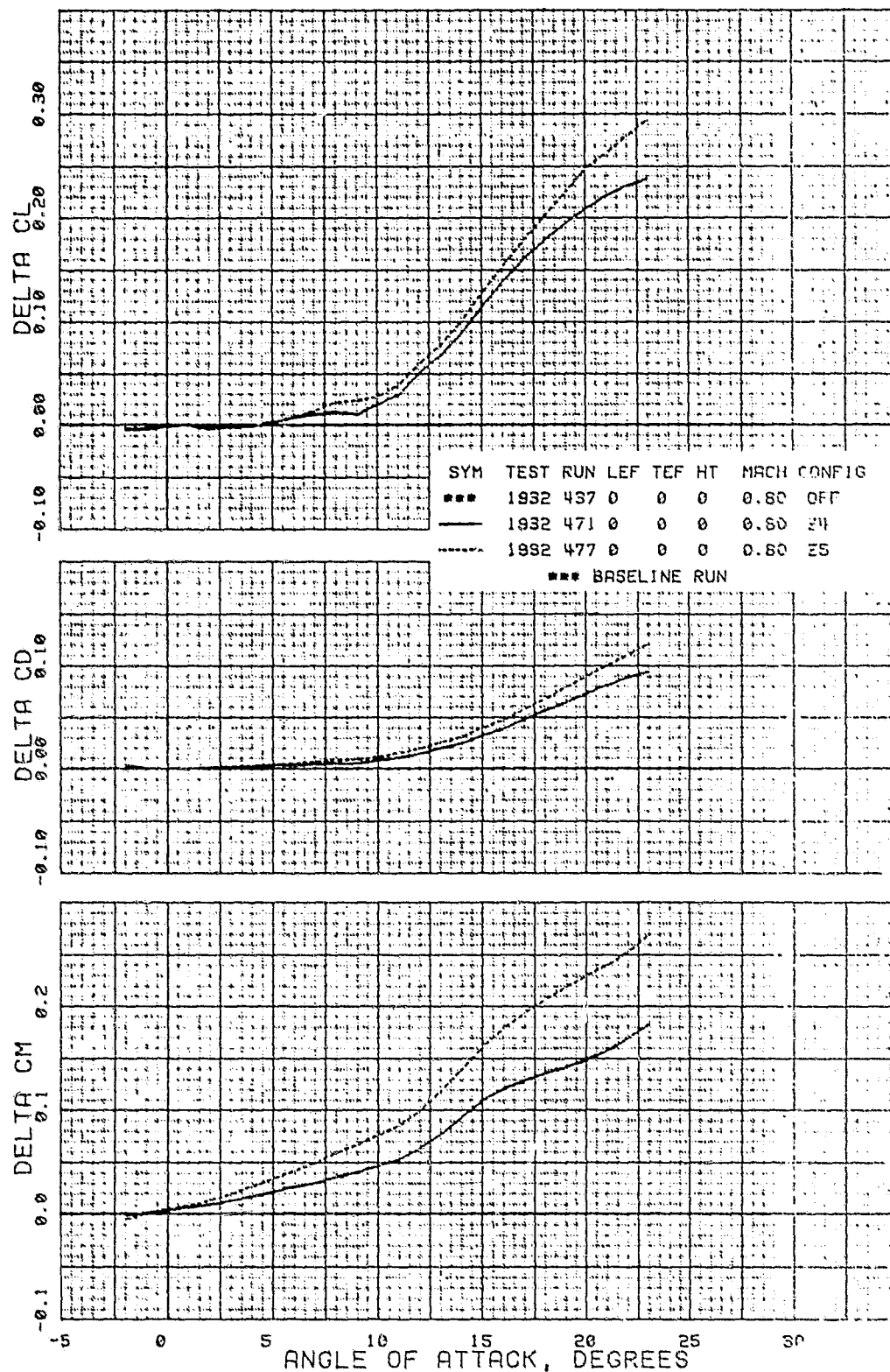


Figure 3-21 (d) Increments

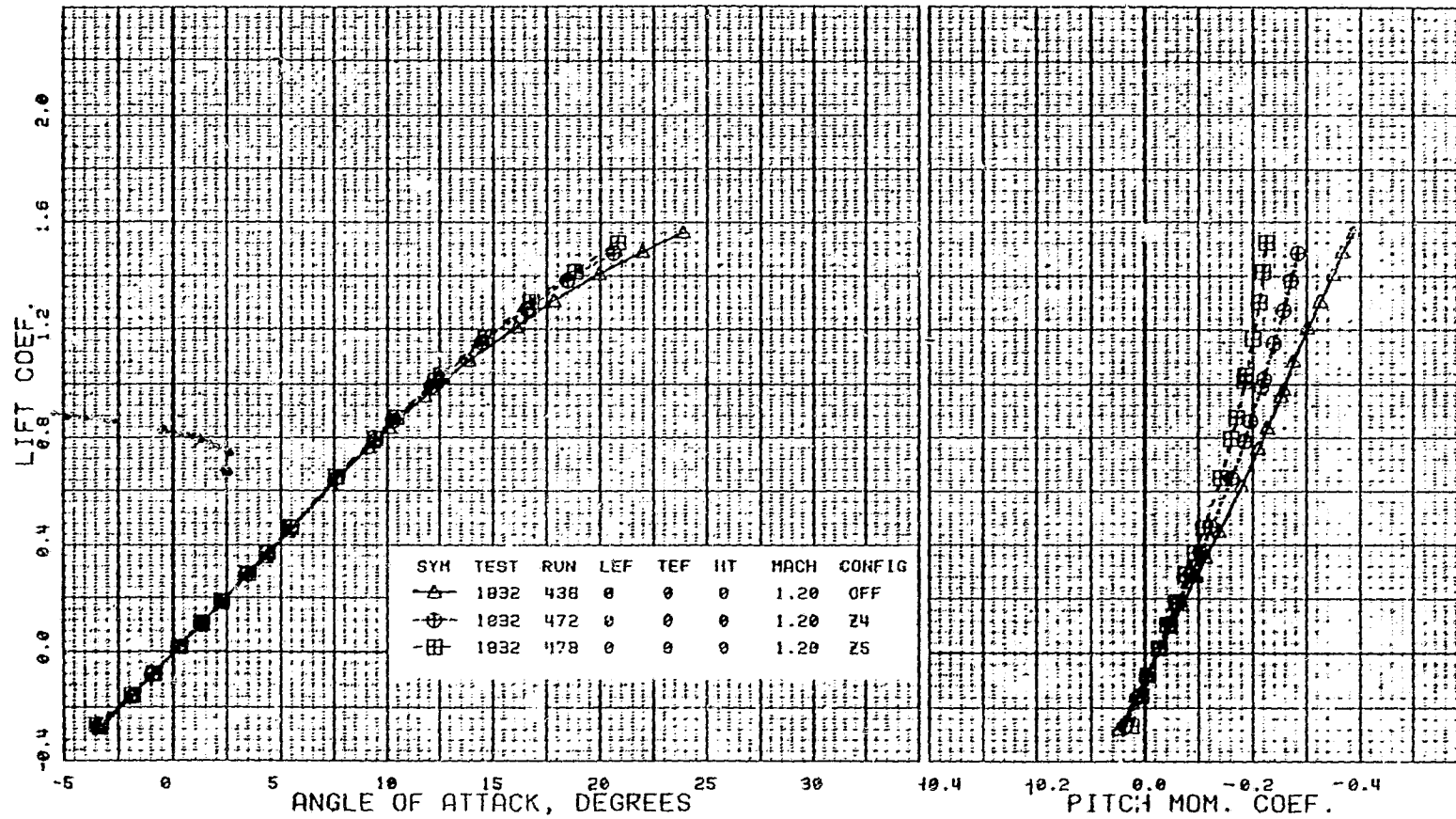


Figure 3-22 Effect of Forebody Strakes Z4 and Z5, Configuration
 1832, M = 1.20
 (a) Lift and Pitching Moment

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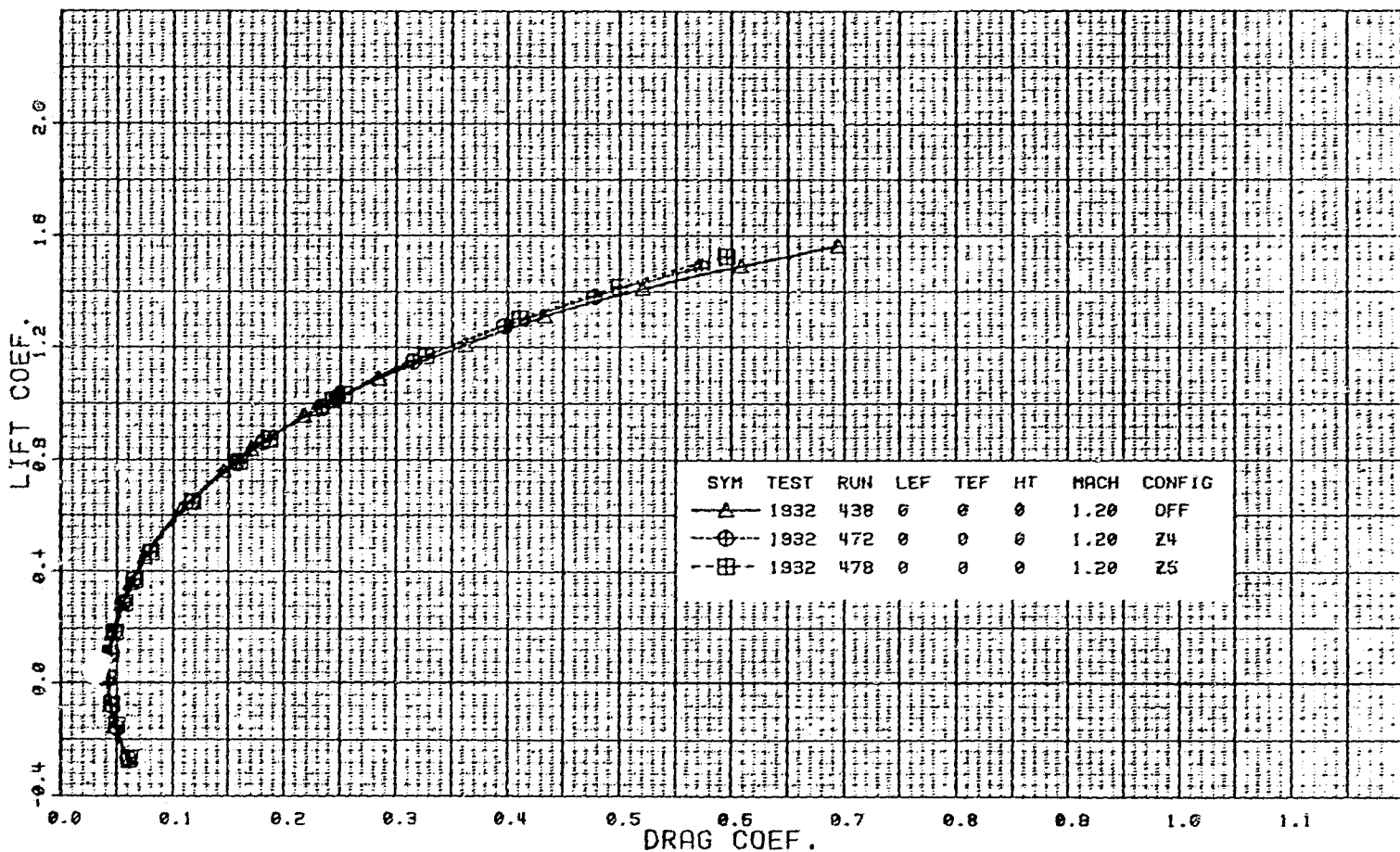


Figure 3-22 (b) Drag, Large Scale

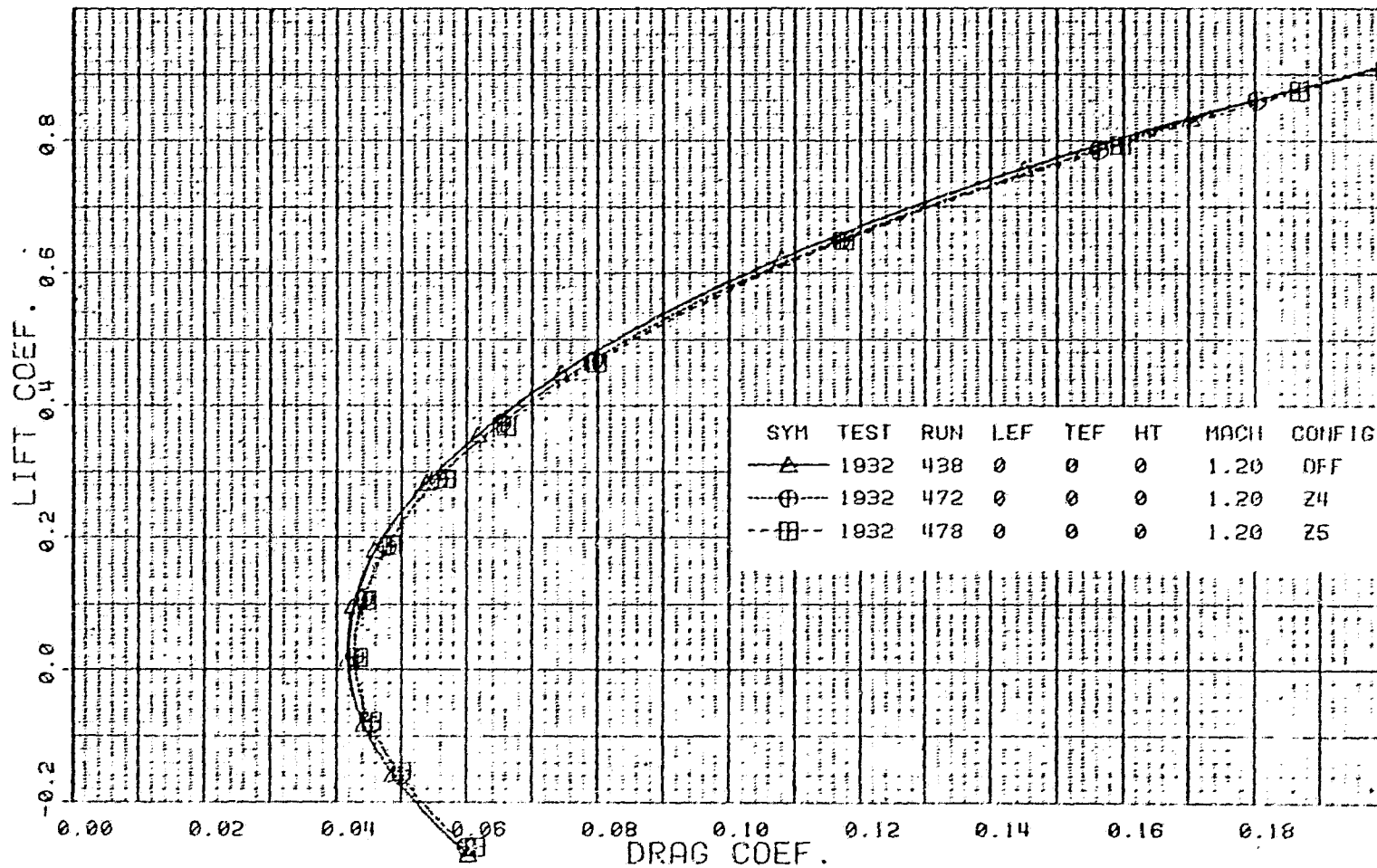


Figure 3-22 (c) Drag, Small Scale

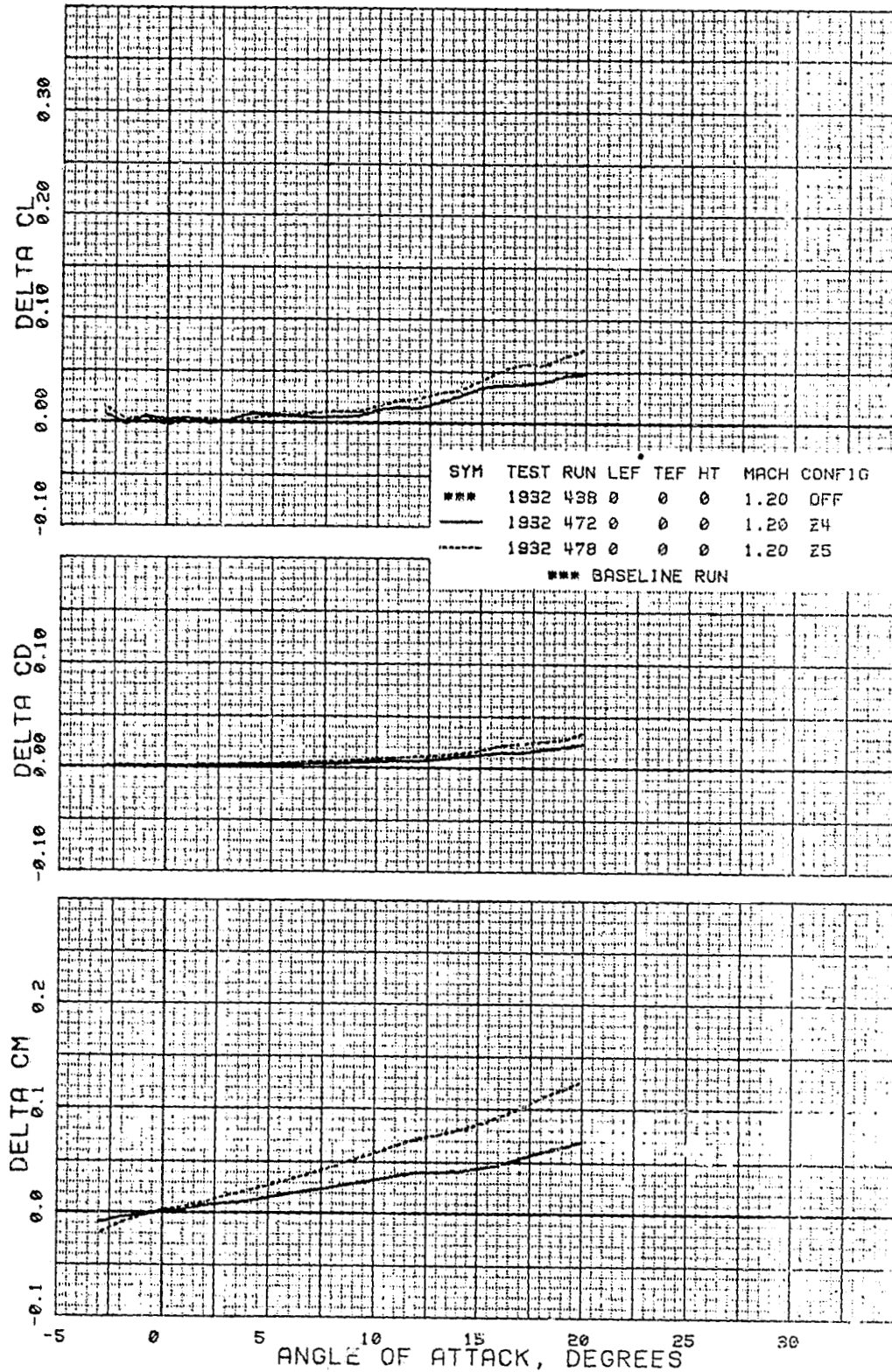


Figure 3-22 (d) Increments

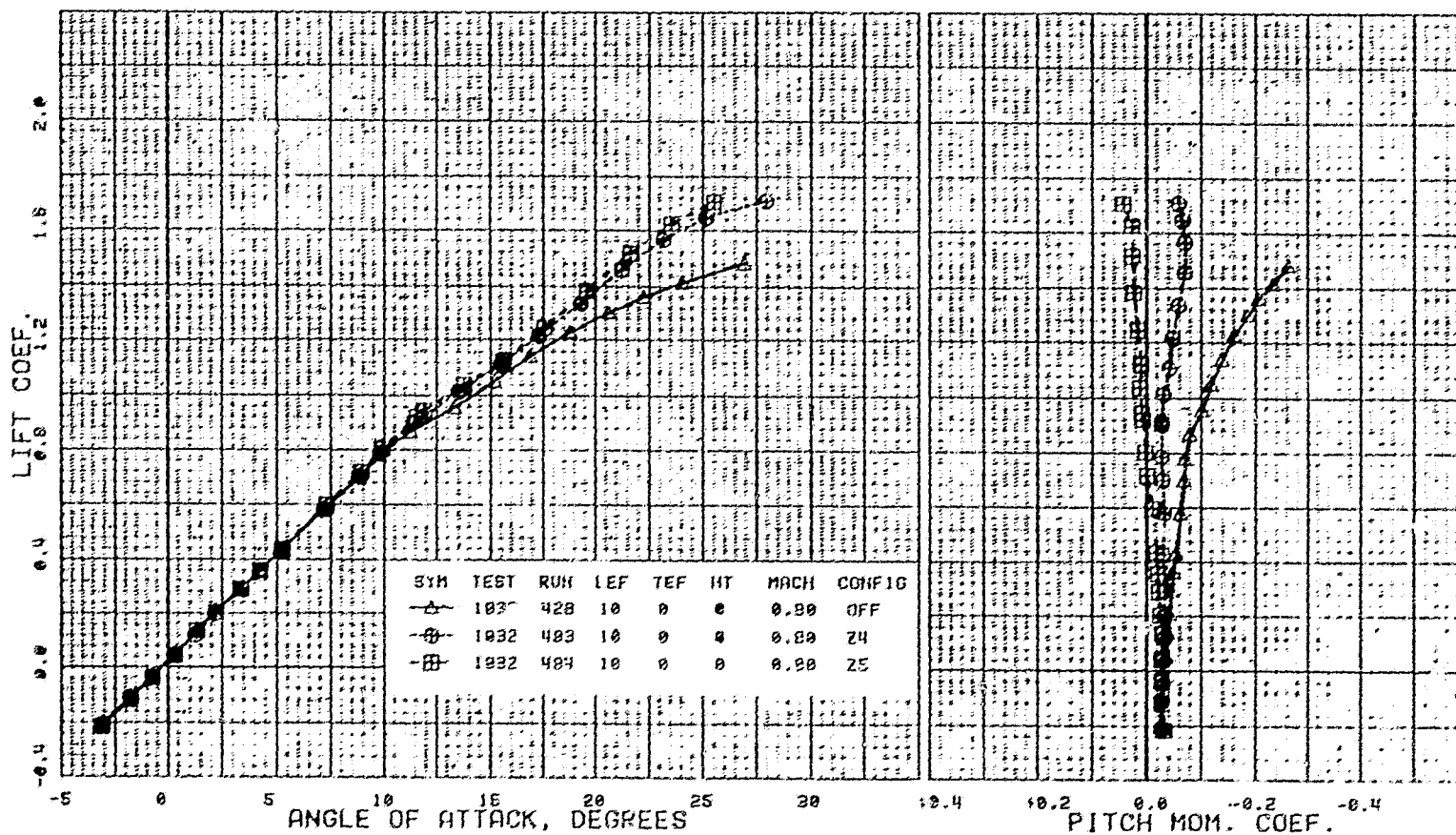


Figure 3-23 Effect of Forebody Strakes Z4 and Z5, Configuration 401F-5,
 LEF = 10° , M = 0.80
 (a) Lift and Pitching Moment

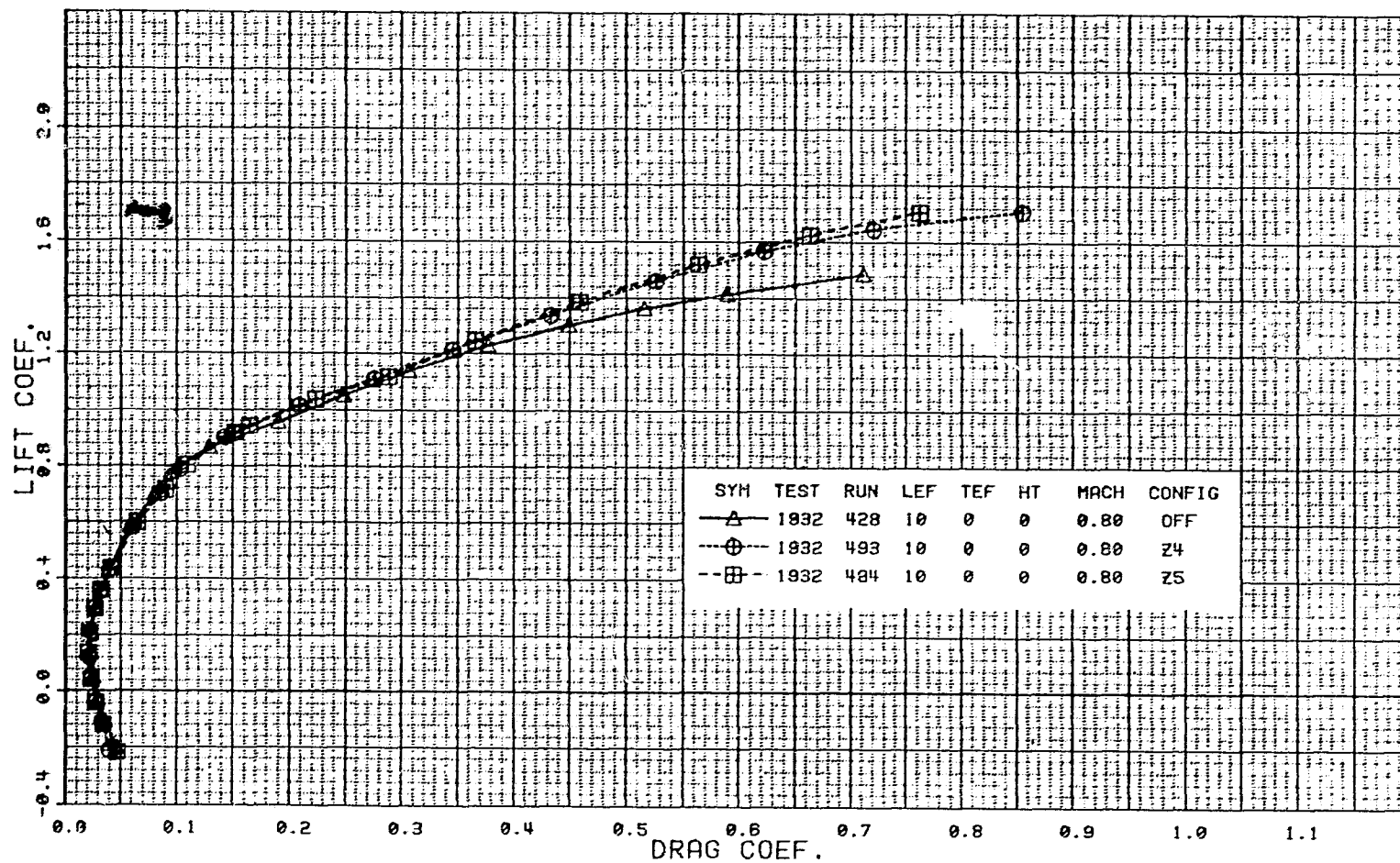


Figure 3-23 (b) Drag, Large Scale

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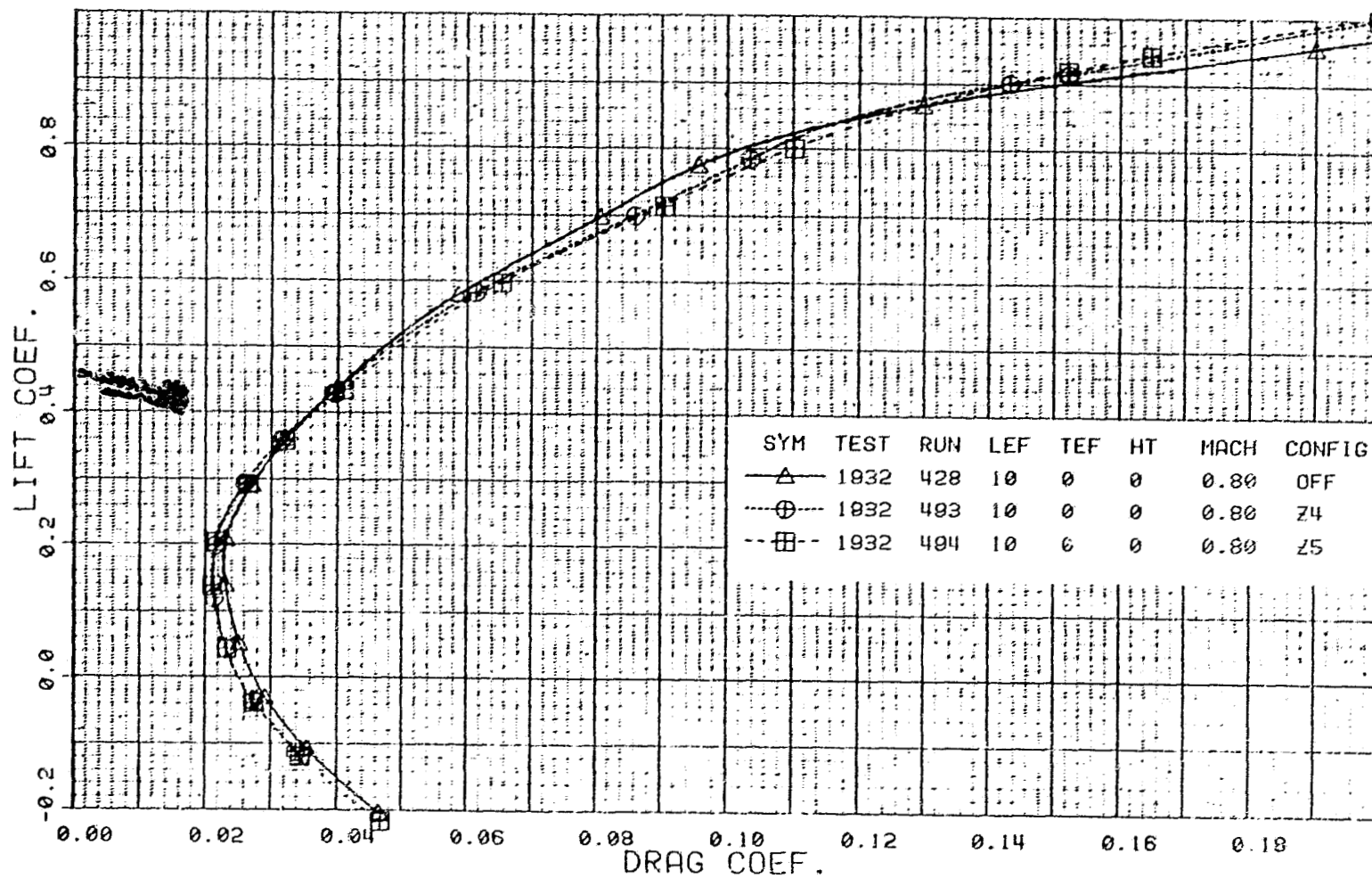


Figure 3-23 (c) Drag, Small Scale

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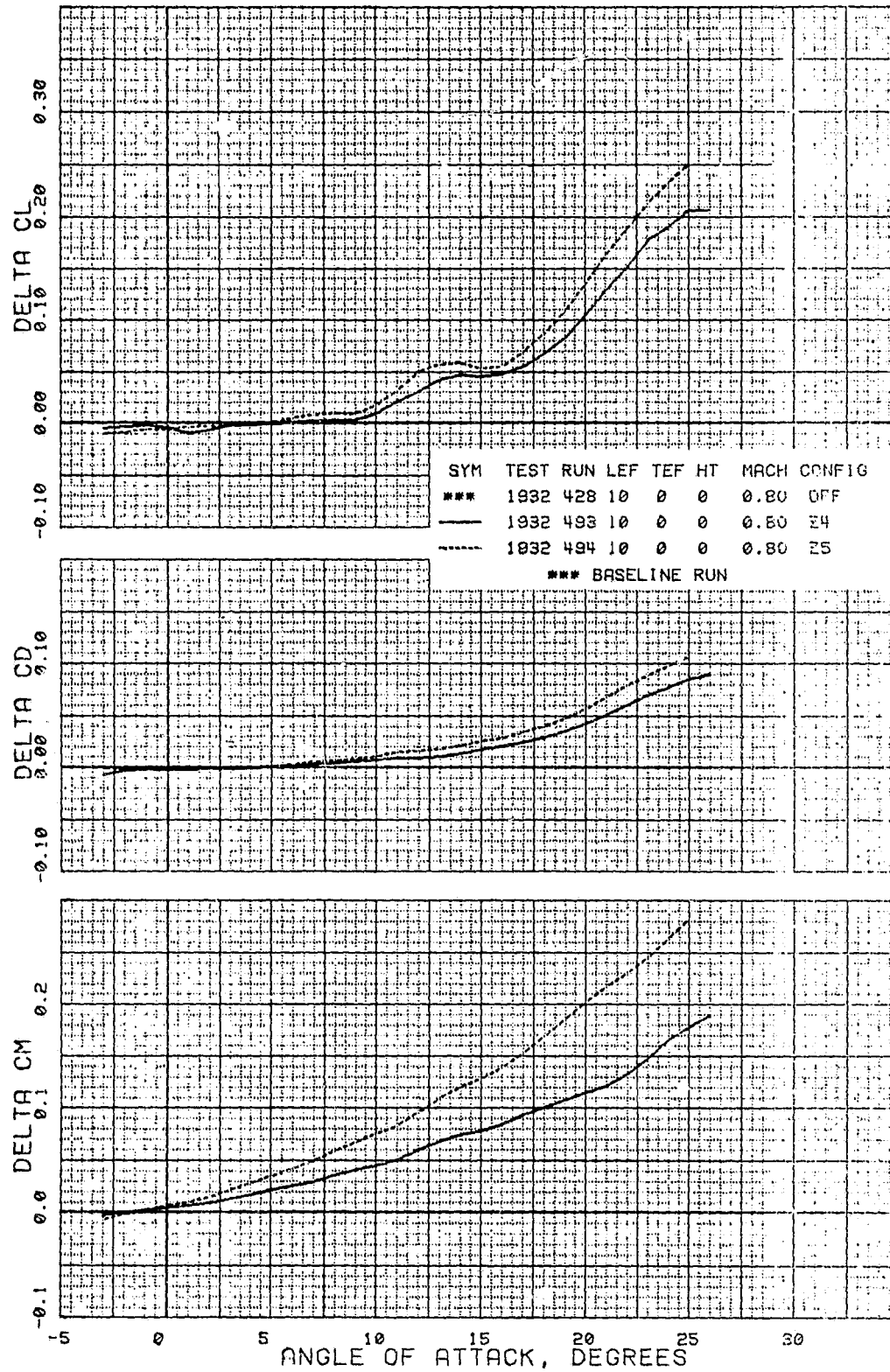


Figure 3-23 (d) Increments

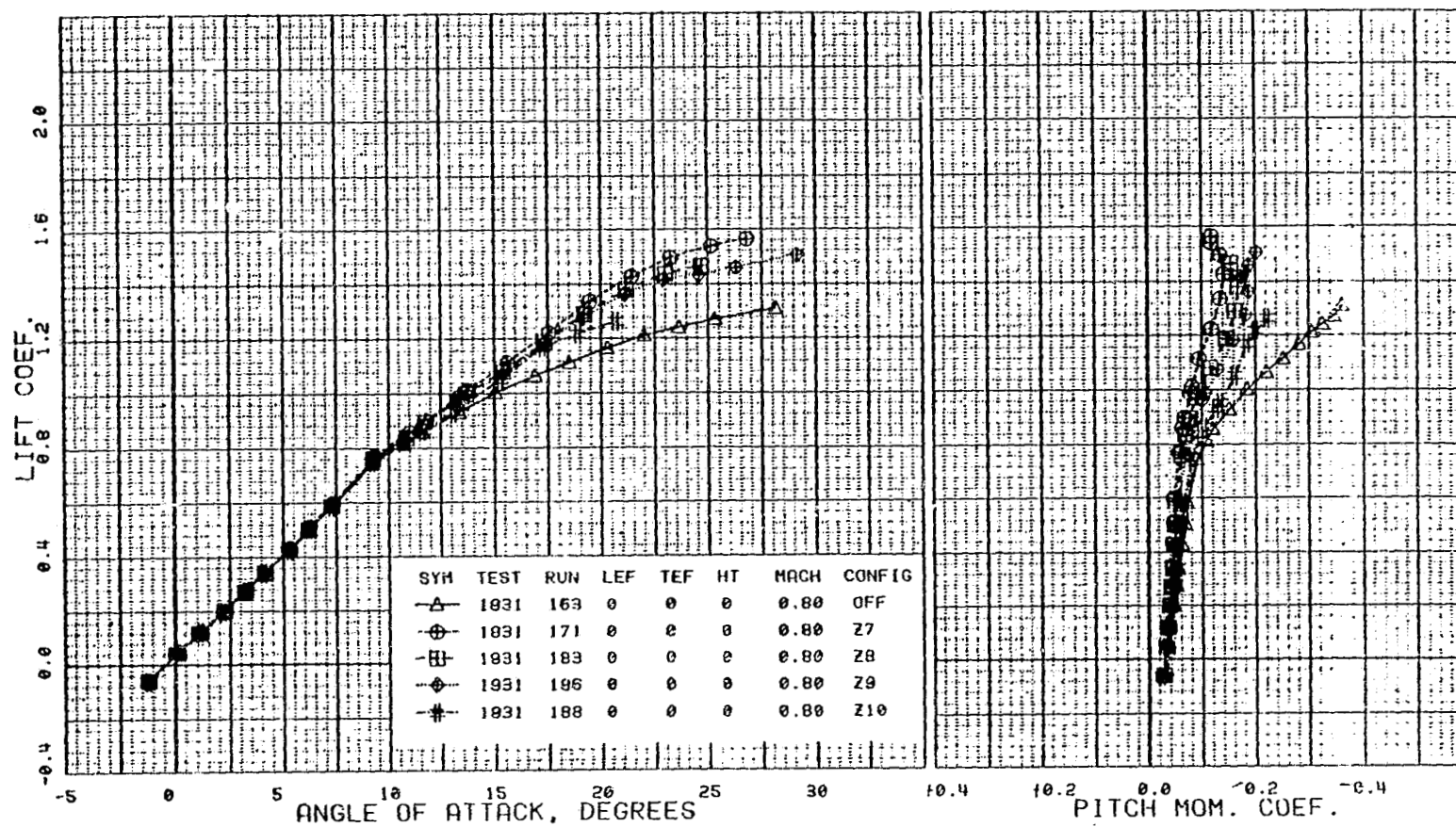


Figure 3-24 Effect of Delta Planform Forebody Strakes (Z7-Z10)
 Configuration 785, LEF = 0, M = 0.80
 (a) Lift and Pitching Moment

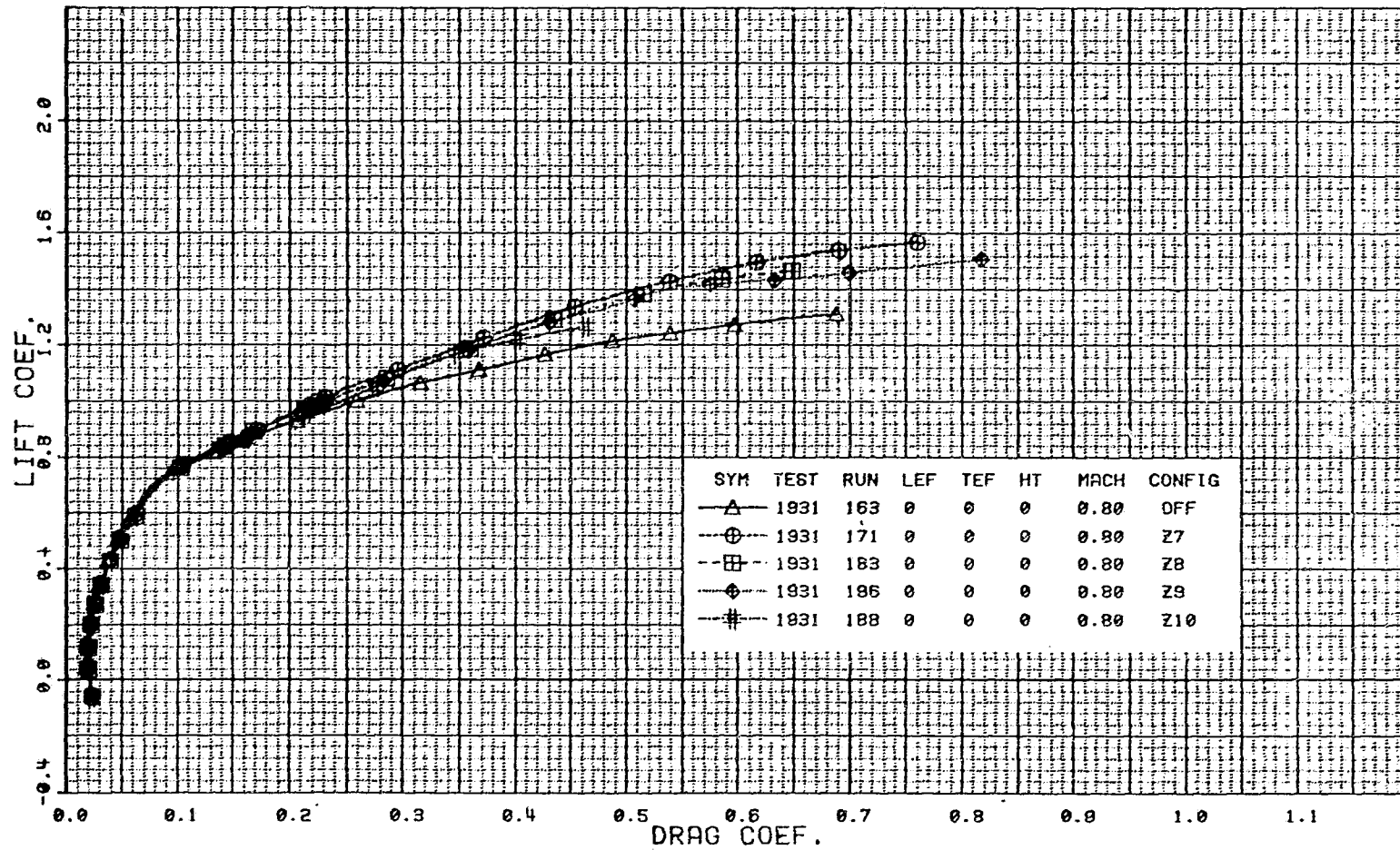


Figure 3-24 (b) Drag, Large Scale

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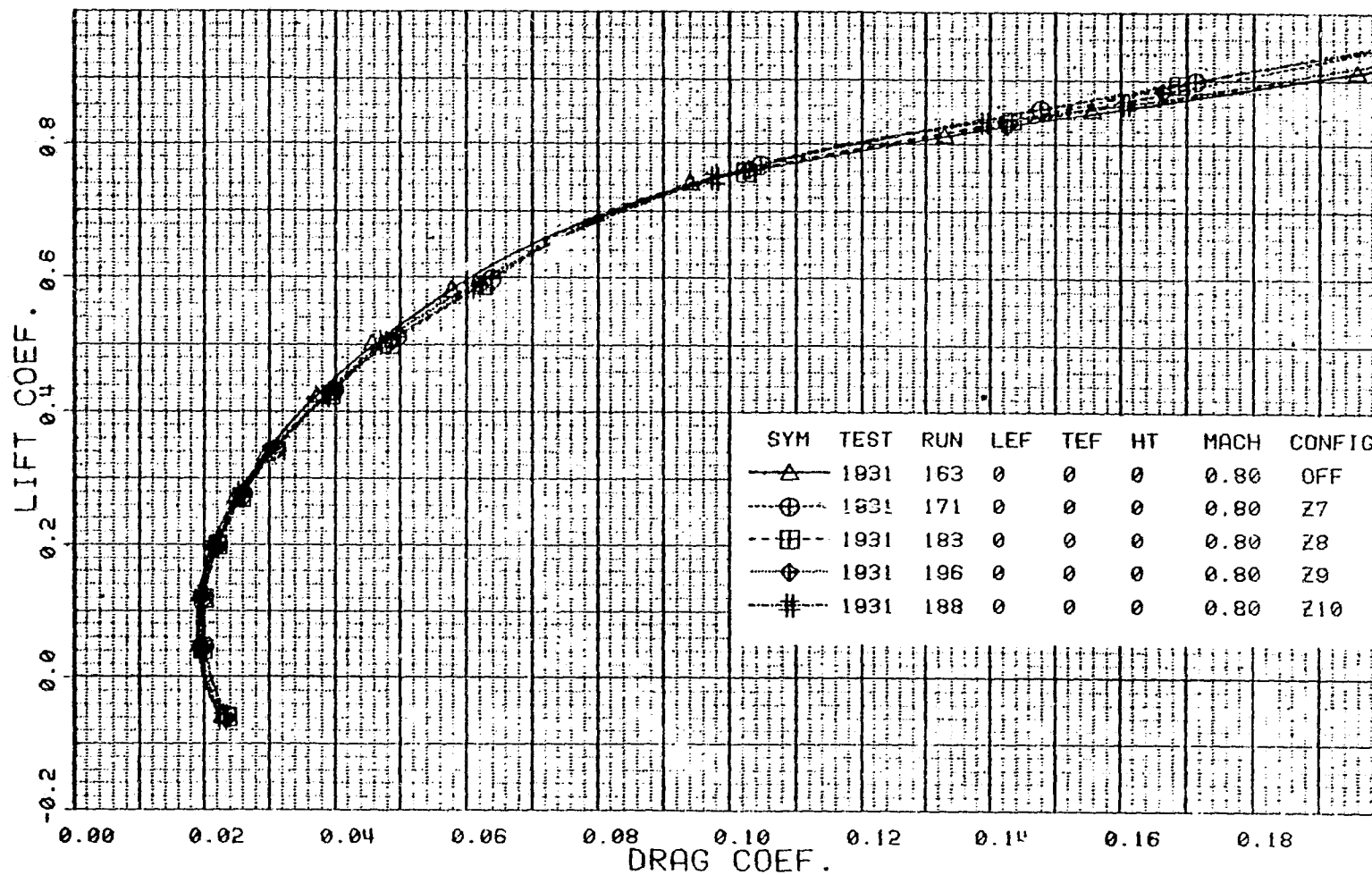


Figure 3-24 (c) Drag, Small Scale

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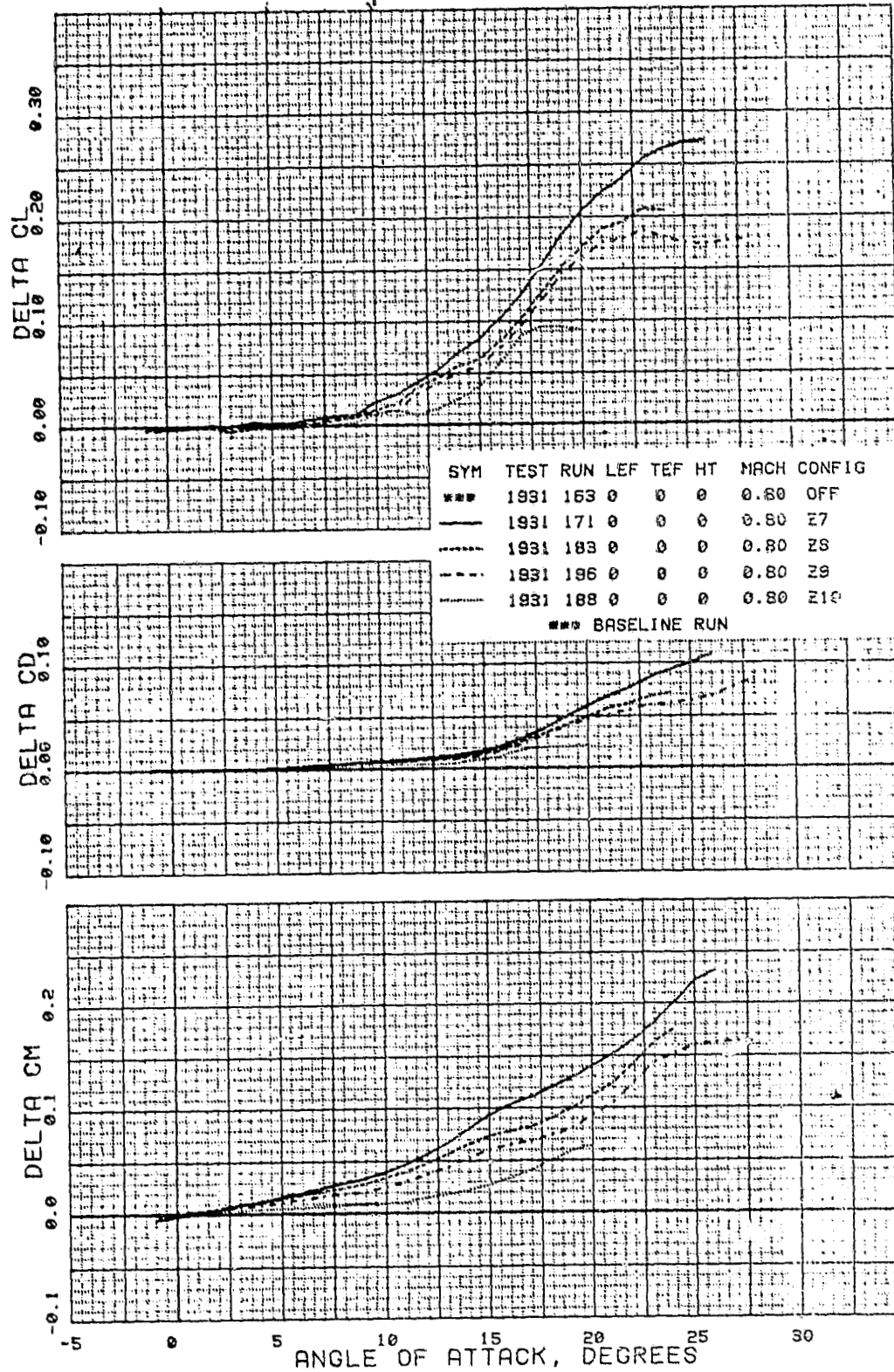


Figure 3-24 (d) Increments

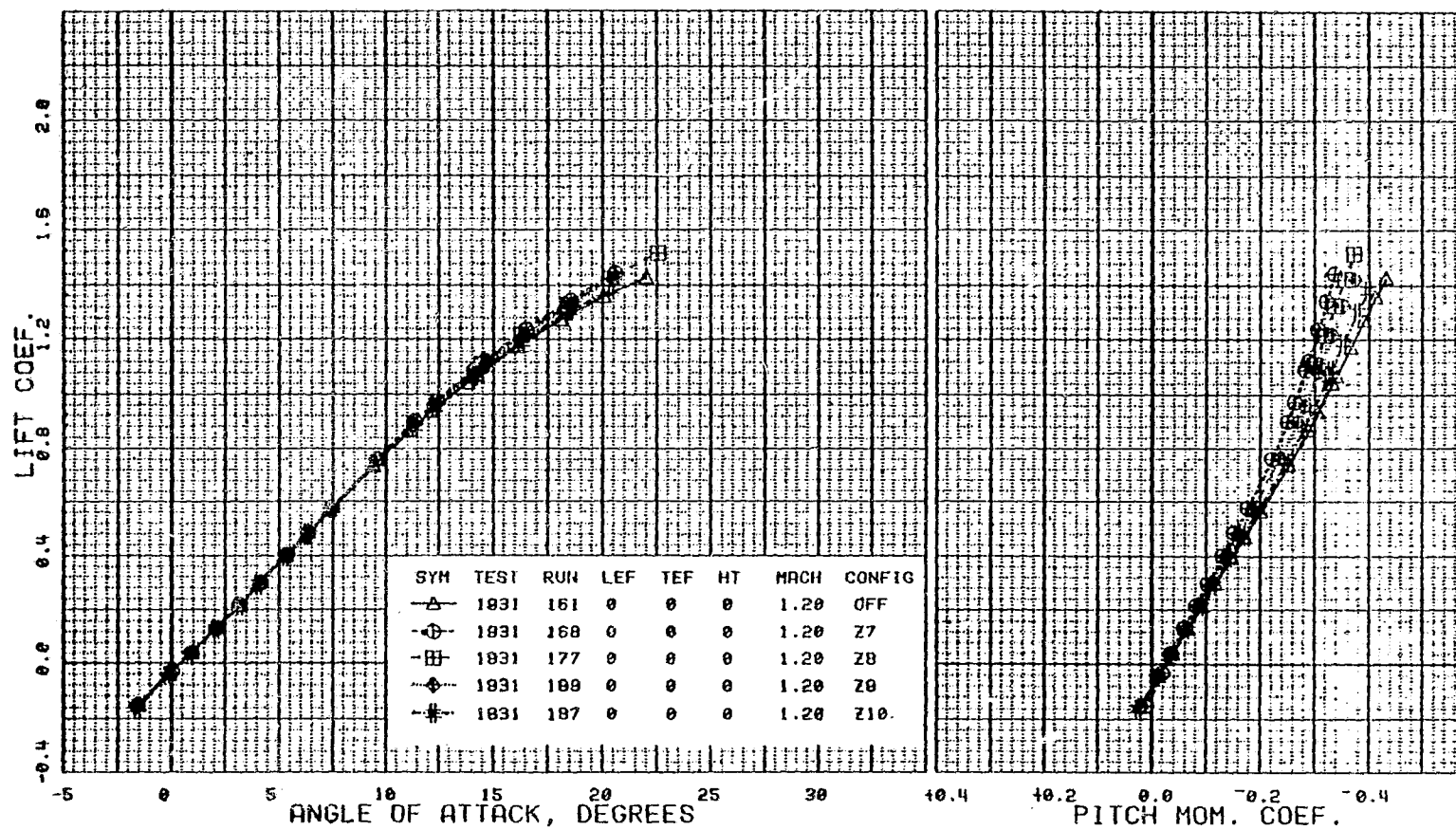


Figure 3-25 Effect of Delta Planform Forebody Strakes (Z7-Z10)
Configuration 785, $M = 1.20$
(a) Lift and Pitching Moment

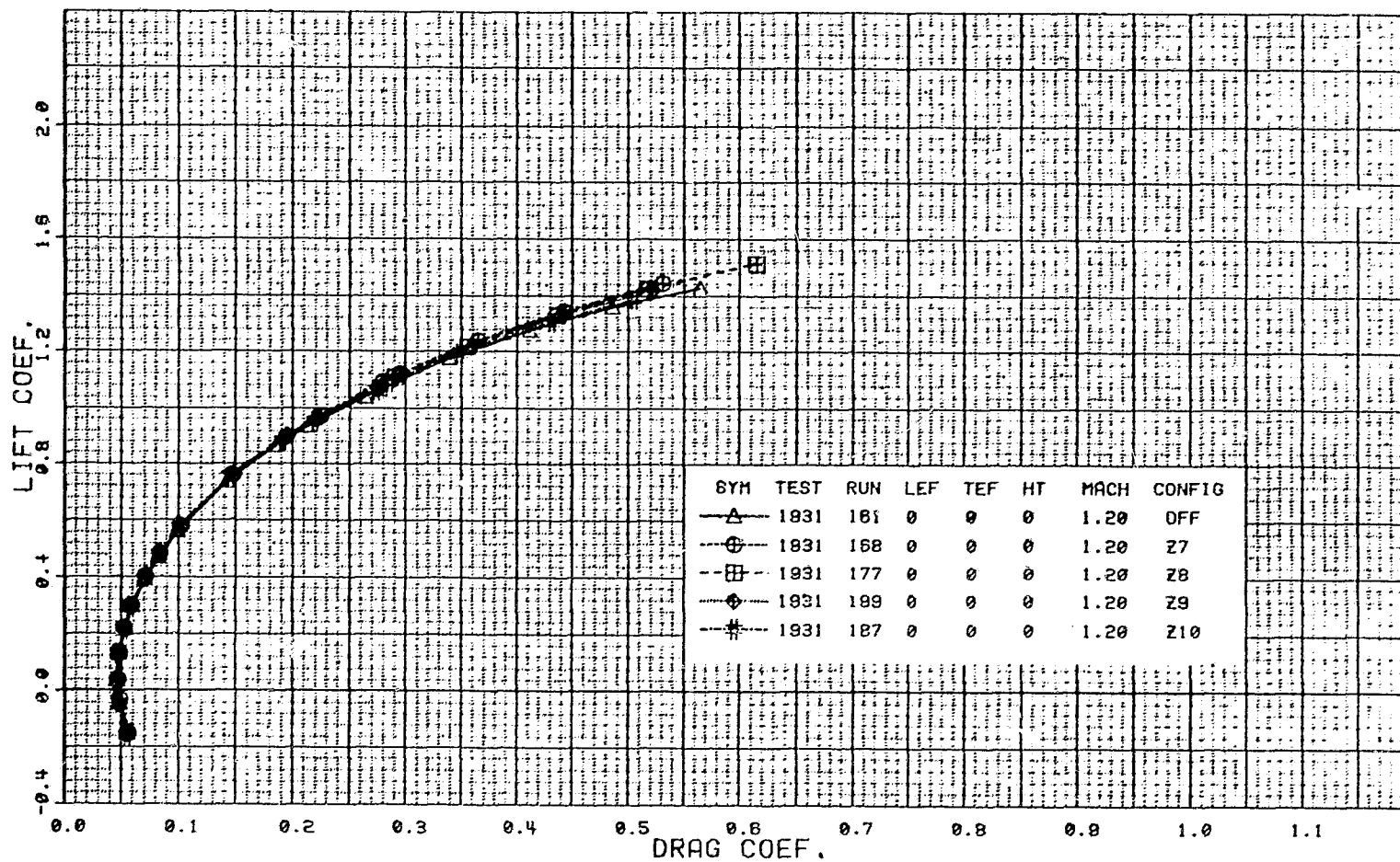


Figure 3-25 (b) Drag, Large Scale

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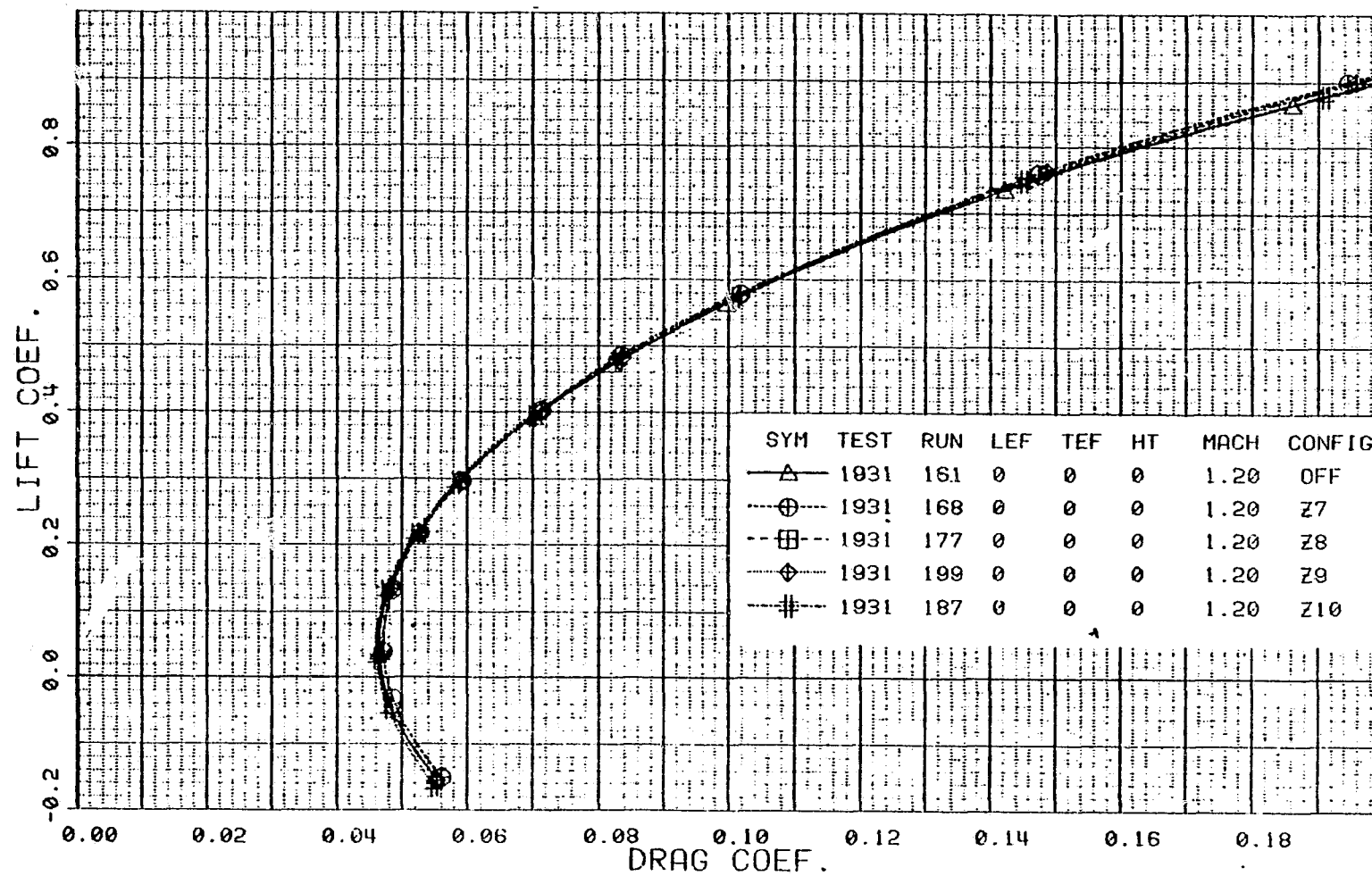


Figure 3-25 (c) Drag, Small Scale

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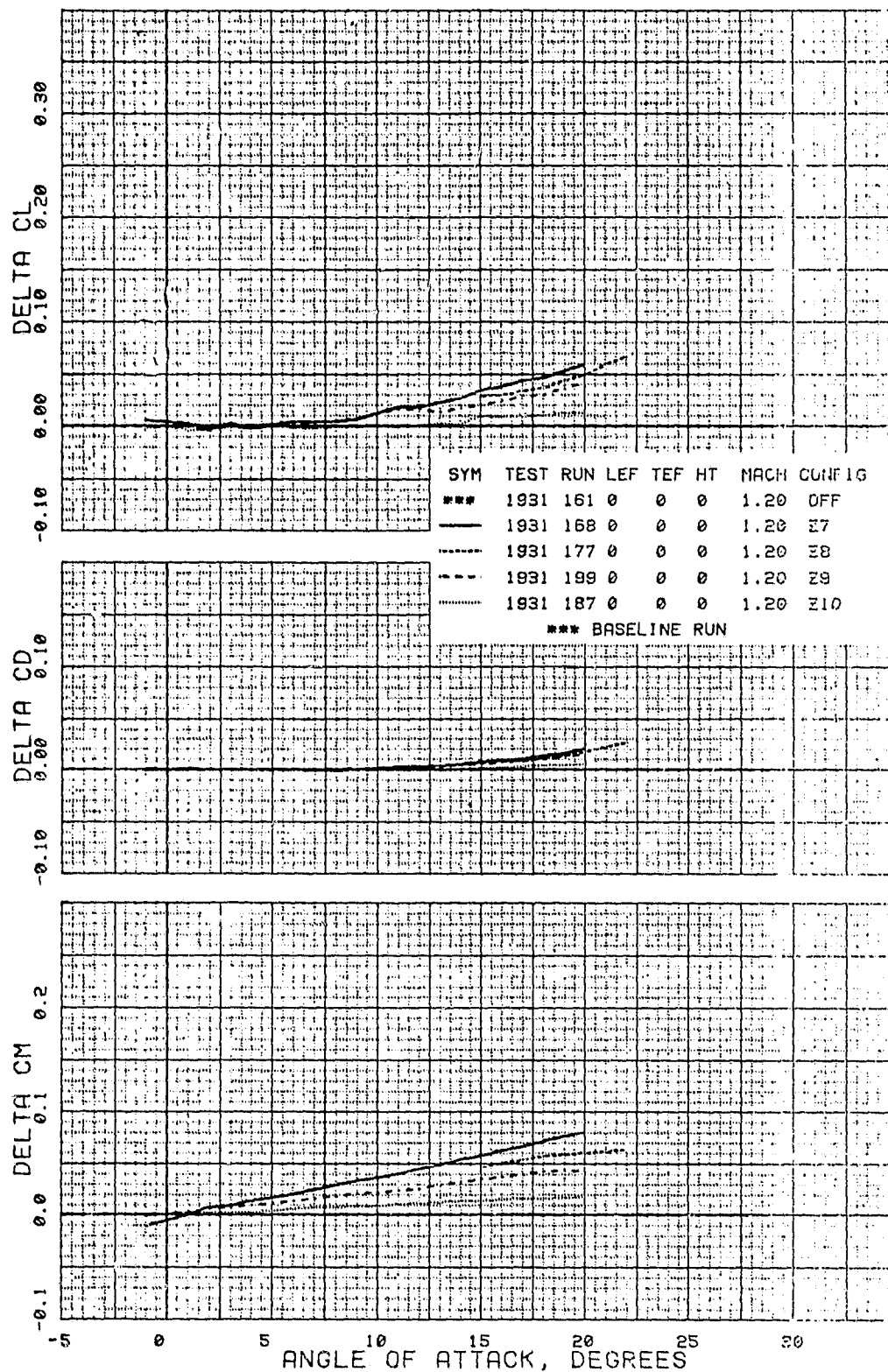


Figure 3-25 (d) Increments

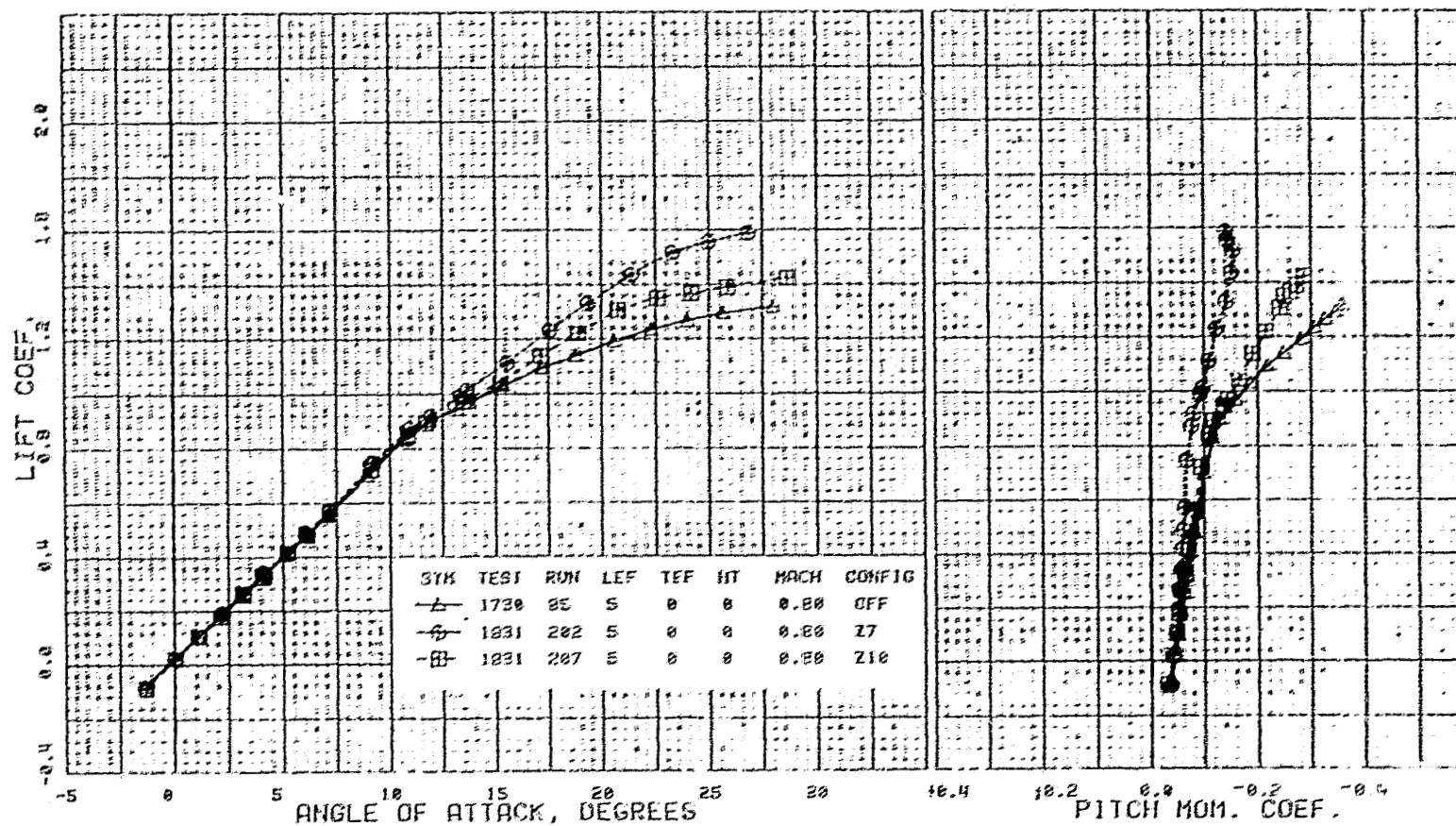


Figure 3-26 Effect of Delta Planform Forebody Strakes (Z7, Z10)
 Configuration 785, $LEF = 5^\circ$, $M = 0.80$
 (a) Lift and Pitching Moment

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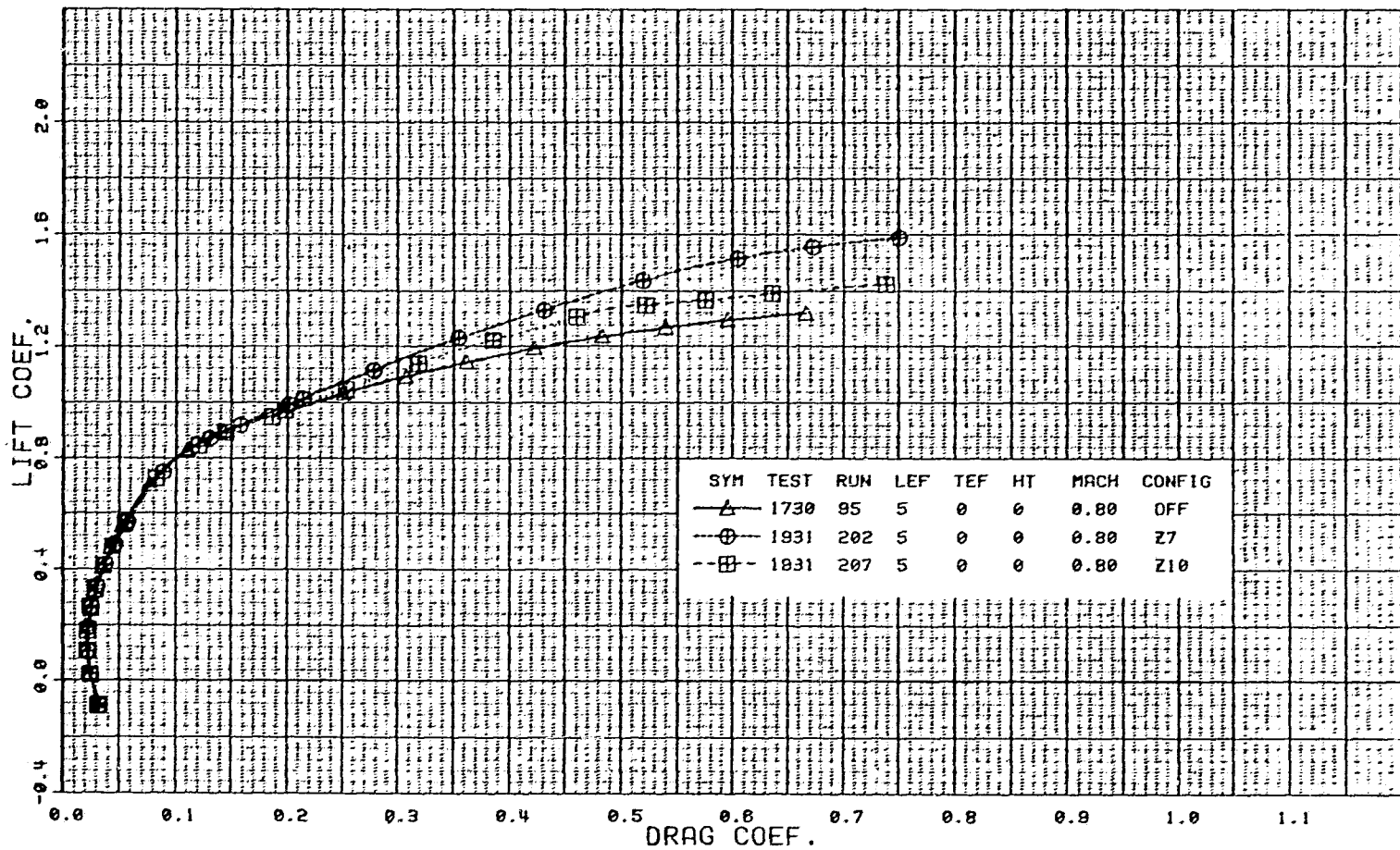


Figure 3-26 (b) Drag, Large Scale

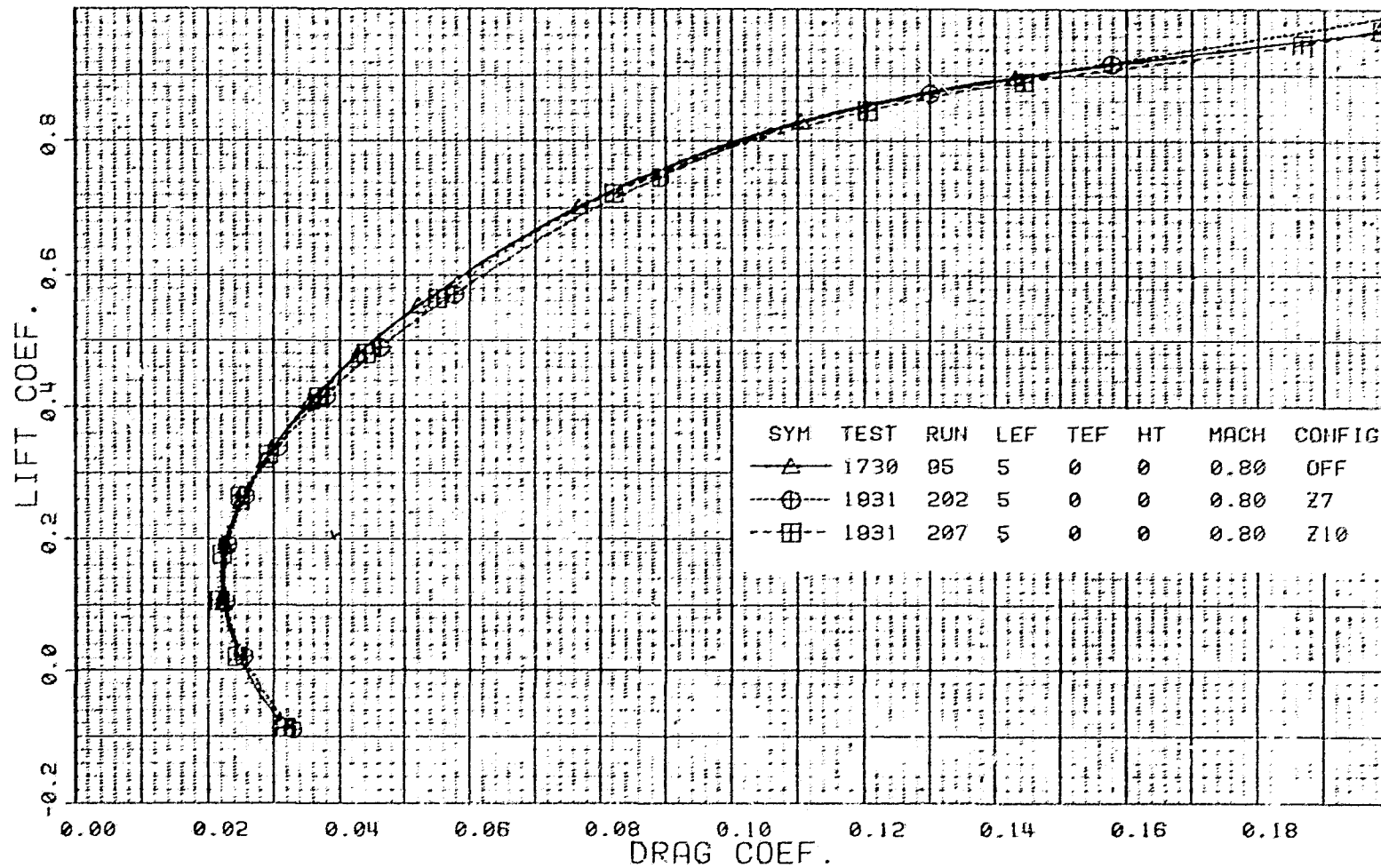


Figure 3-26 (c) Drag, Small Scale

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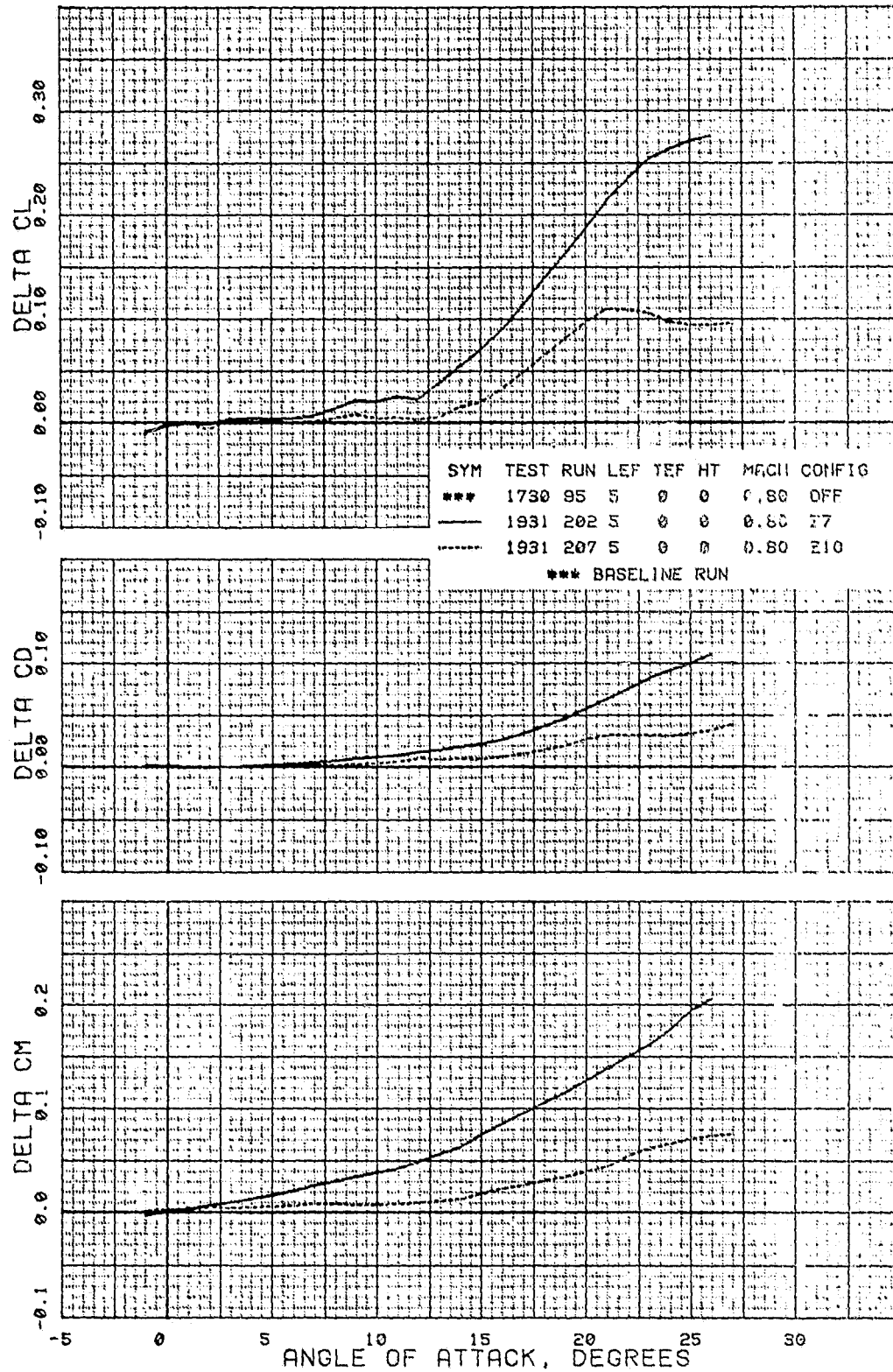


Figure 3-26 (d) Increments
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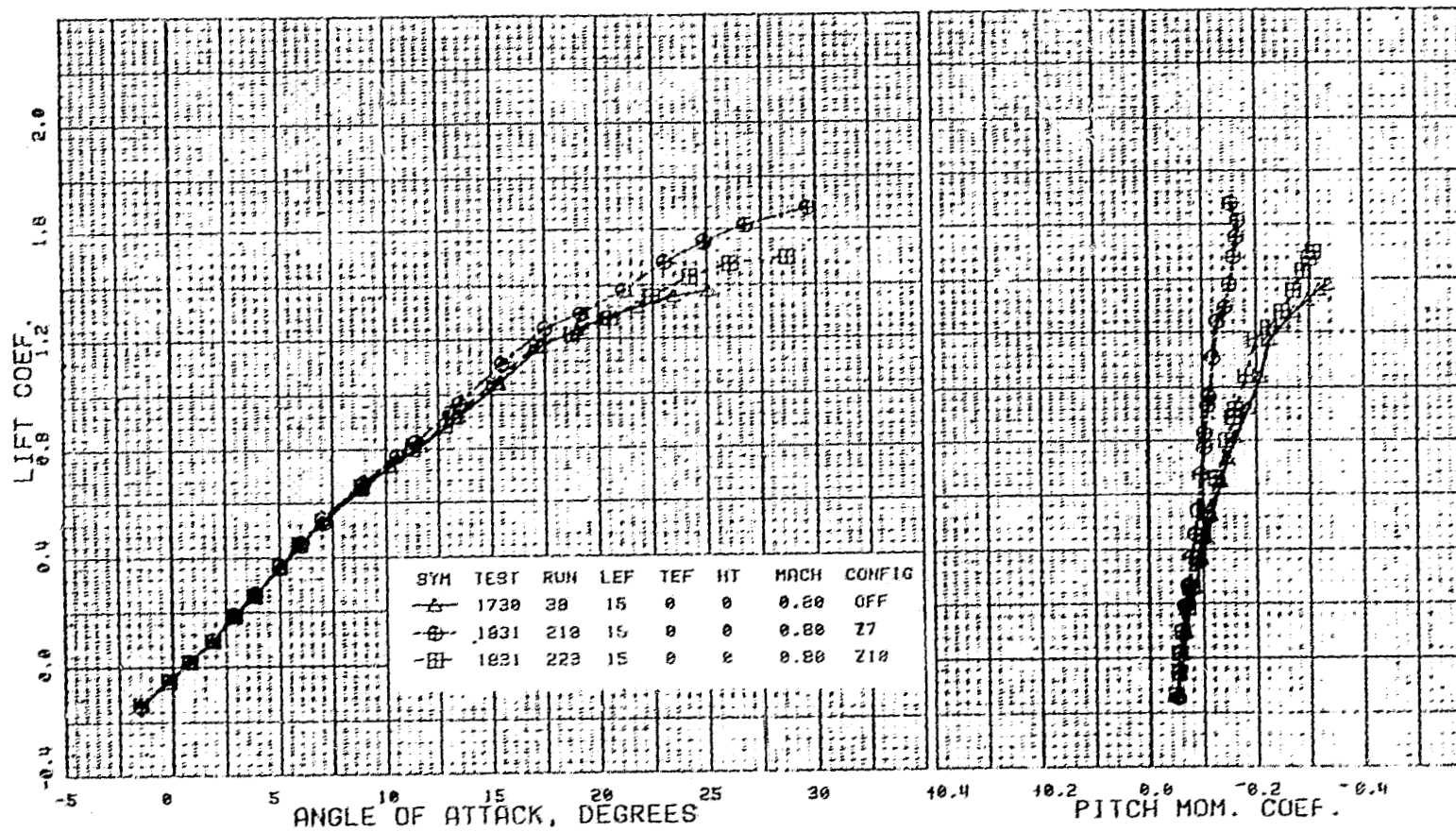


Figure 3-27 Effect of Delta Planform Forebody Strakes (Z7,Z10), Configuration 785, LEF = 15°, M = 0.80
(a) Lift and Pitching Moment

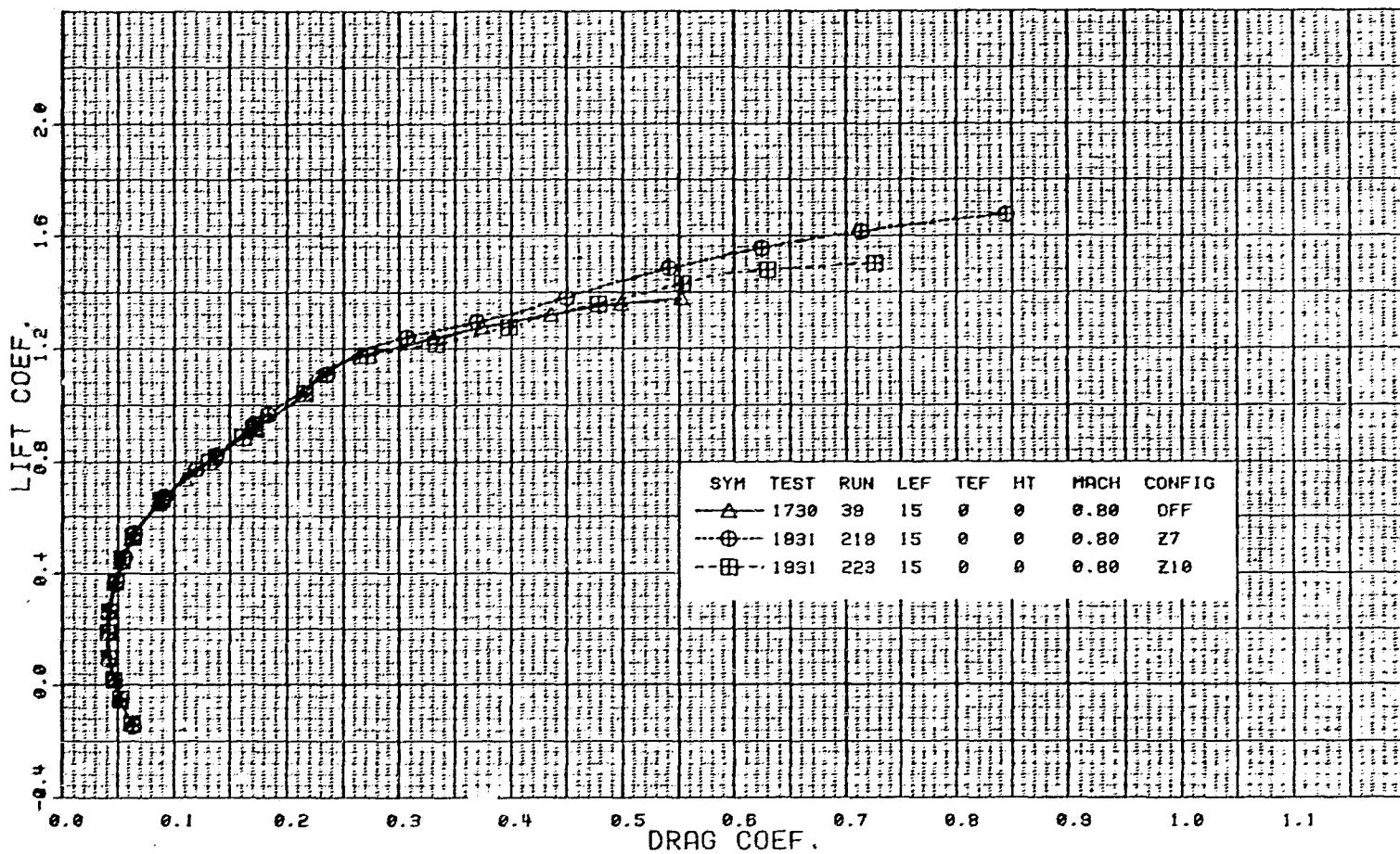


Figure 3-27 (b) Drag, Large Scale

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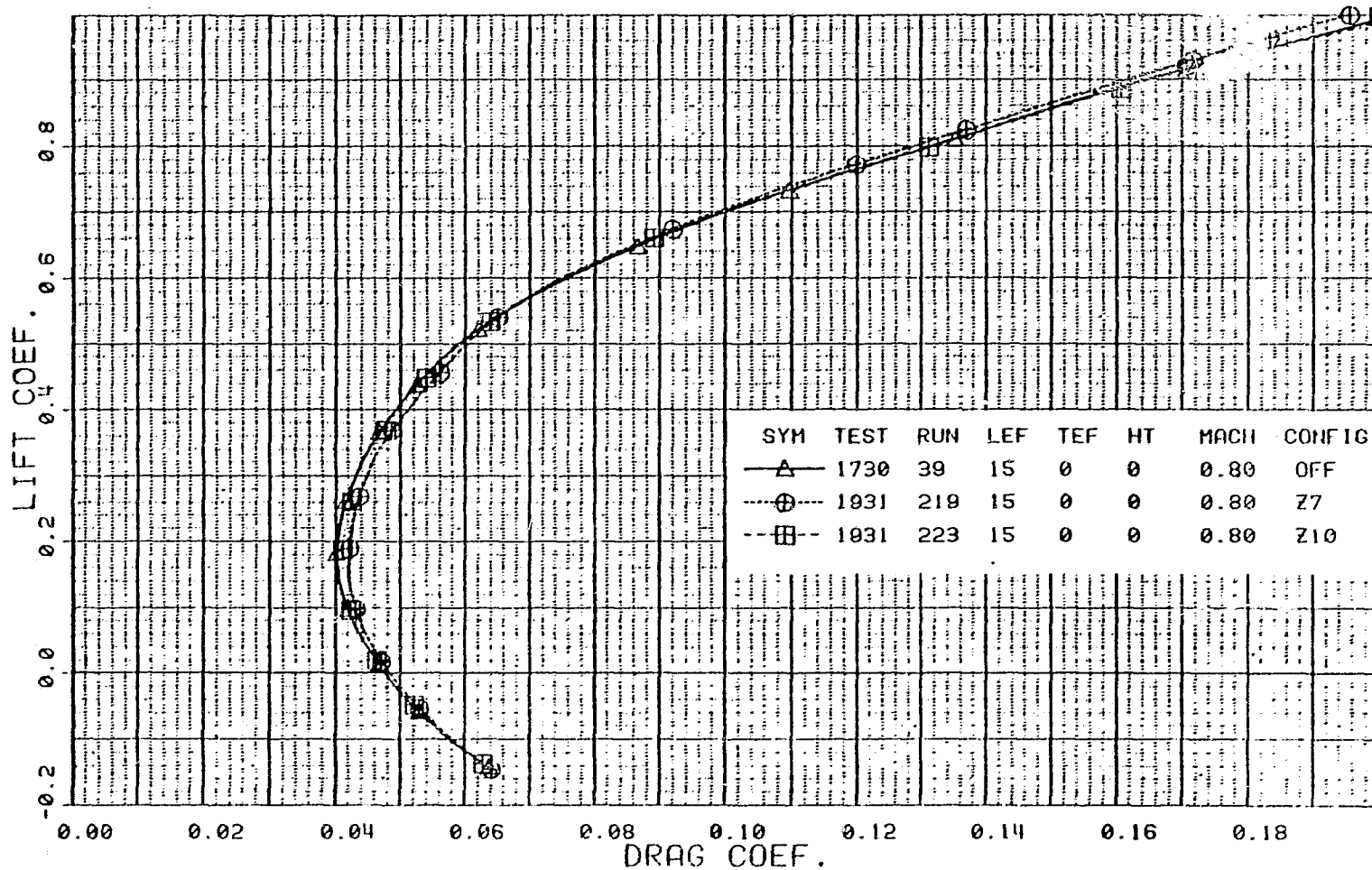


Figure 3-27 (c) Drag, Small Scale

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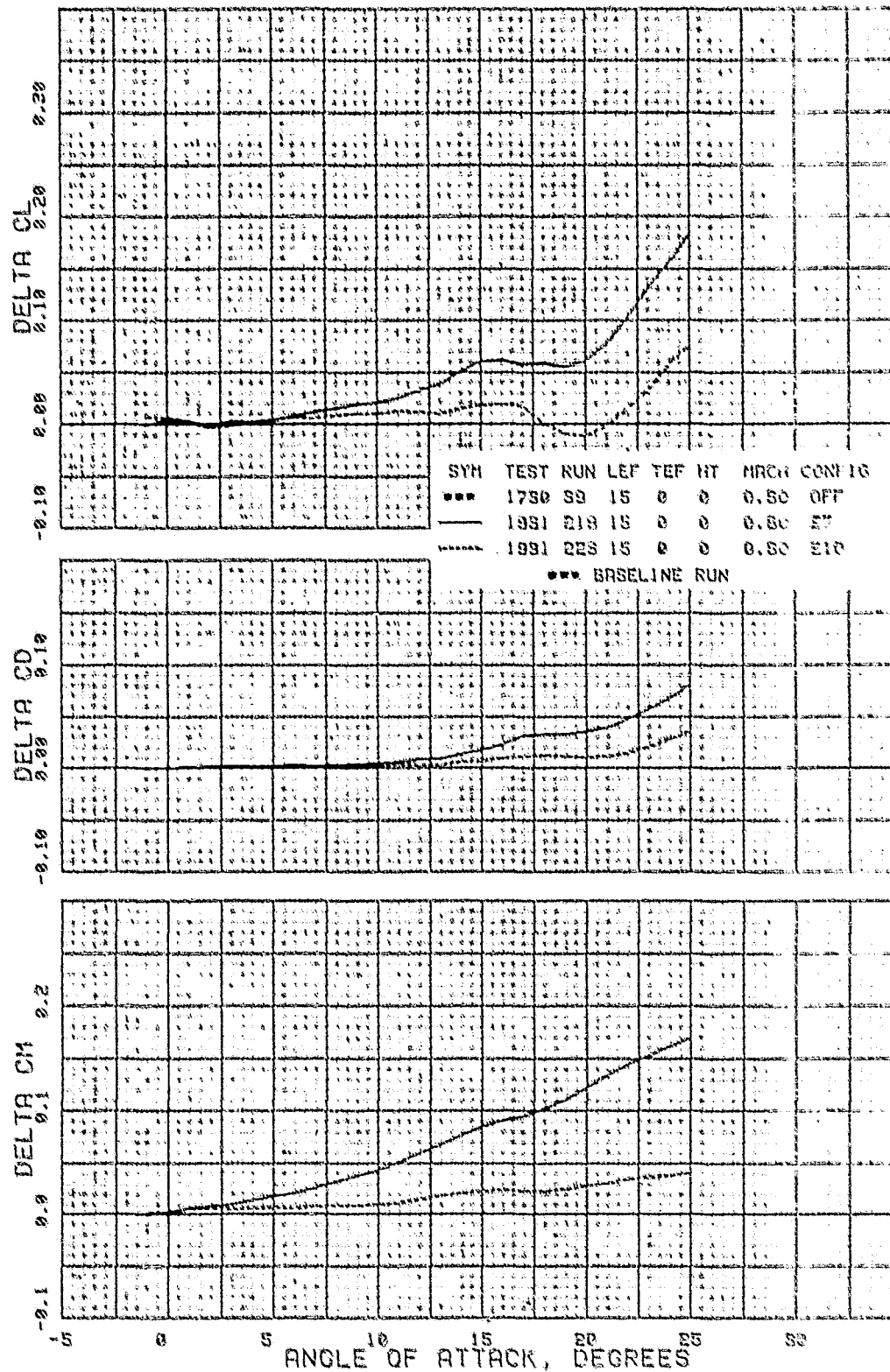


Figure 3-27 (d) Increments

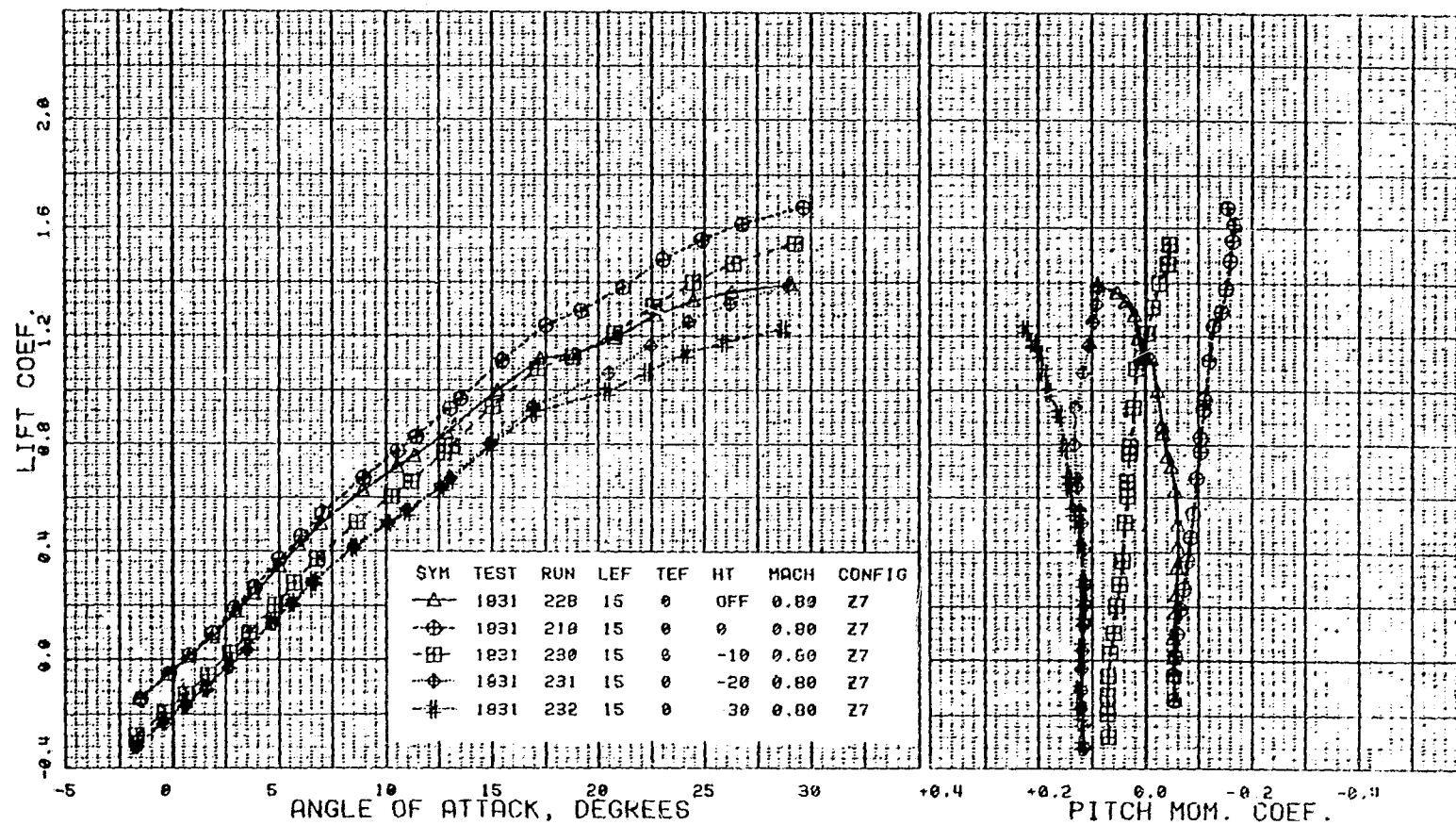


Figure 3-28 Effect of Horizontal Tail Deflection with Forebody Strake Z7, Configuration 785, $M = 0.80$
(a) Lift and Pitching Moment

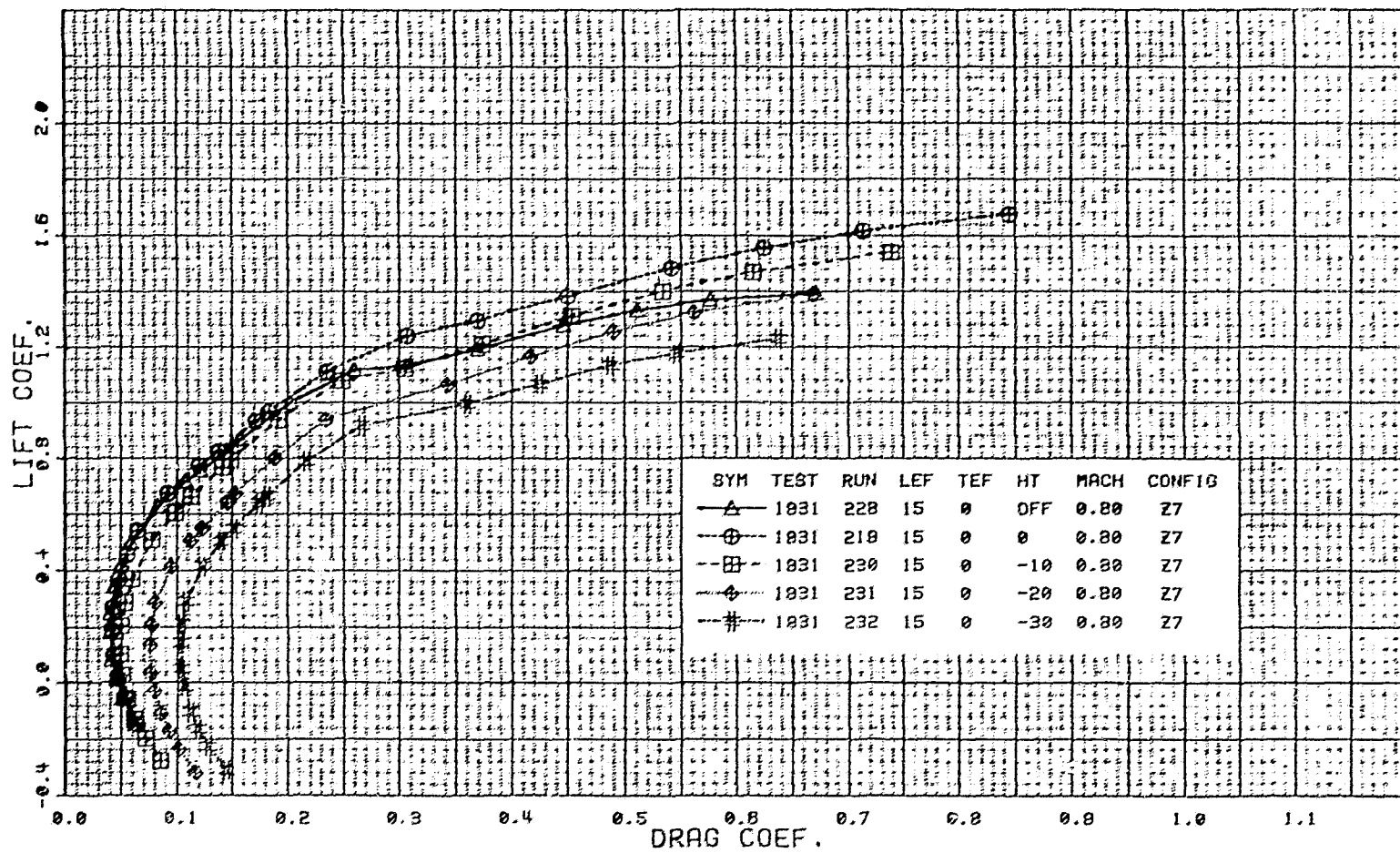


Figure 3-28 (b) Drag, Large Scale

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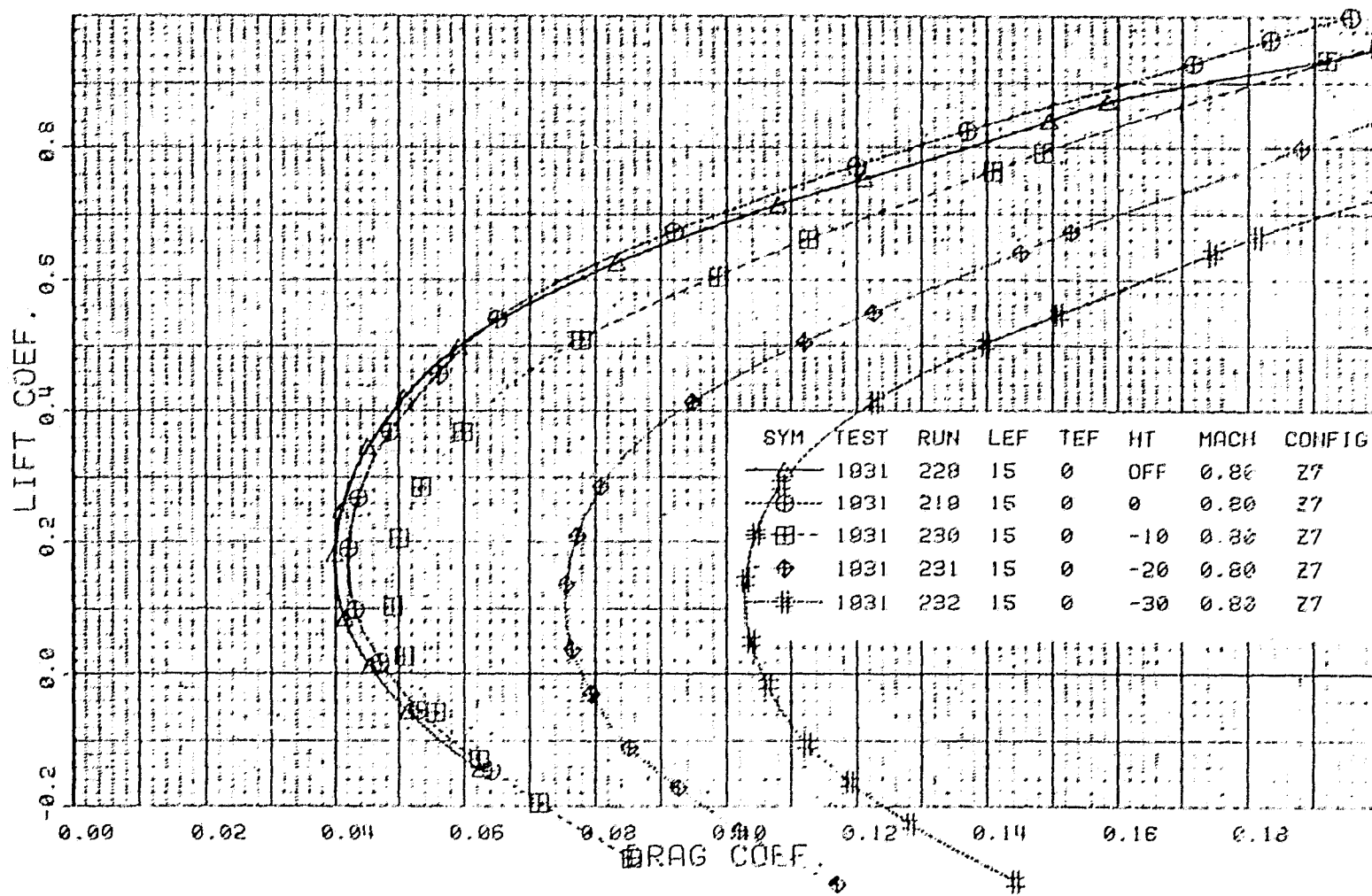


Figure 3-28 (c) Drag, Small Scale

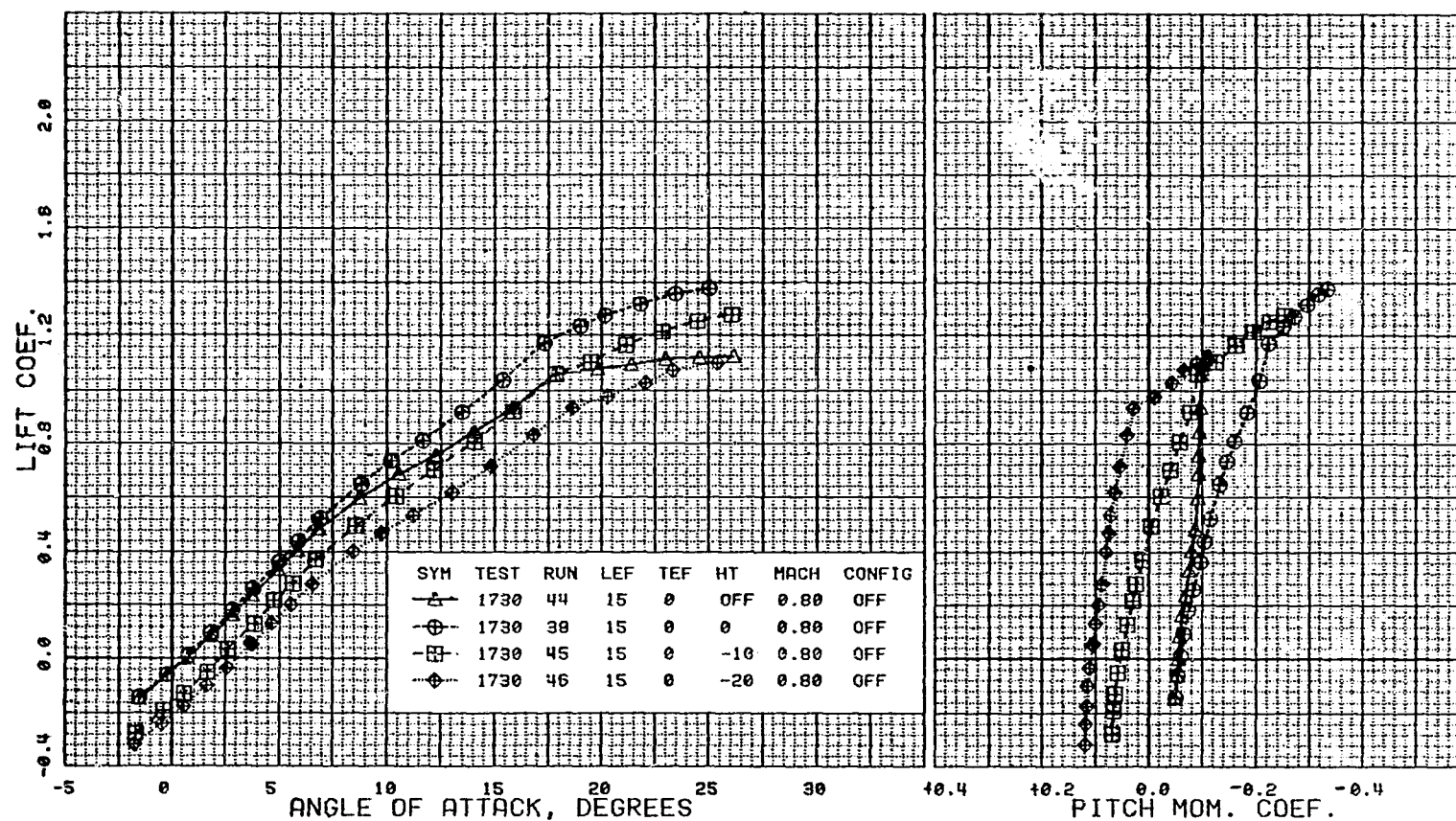


Figure 3-29 Effect of Horizontal Tail Deflection Without a Strake,
Configuration 785, $M = 0.80$
(a) Lift and Pitching Moment

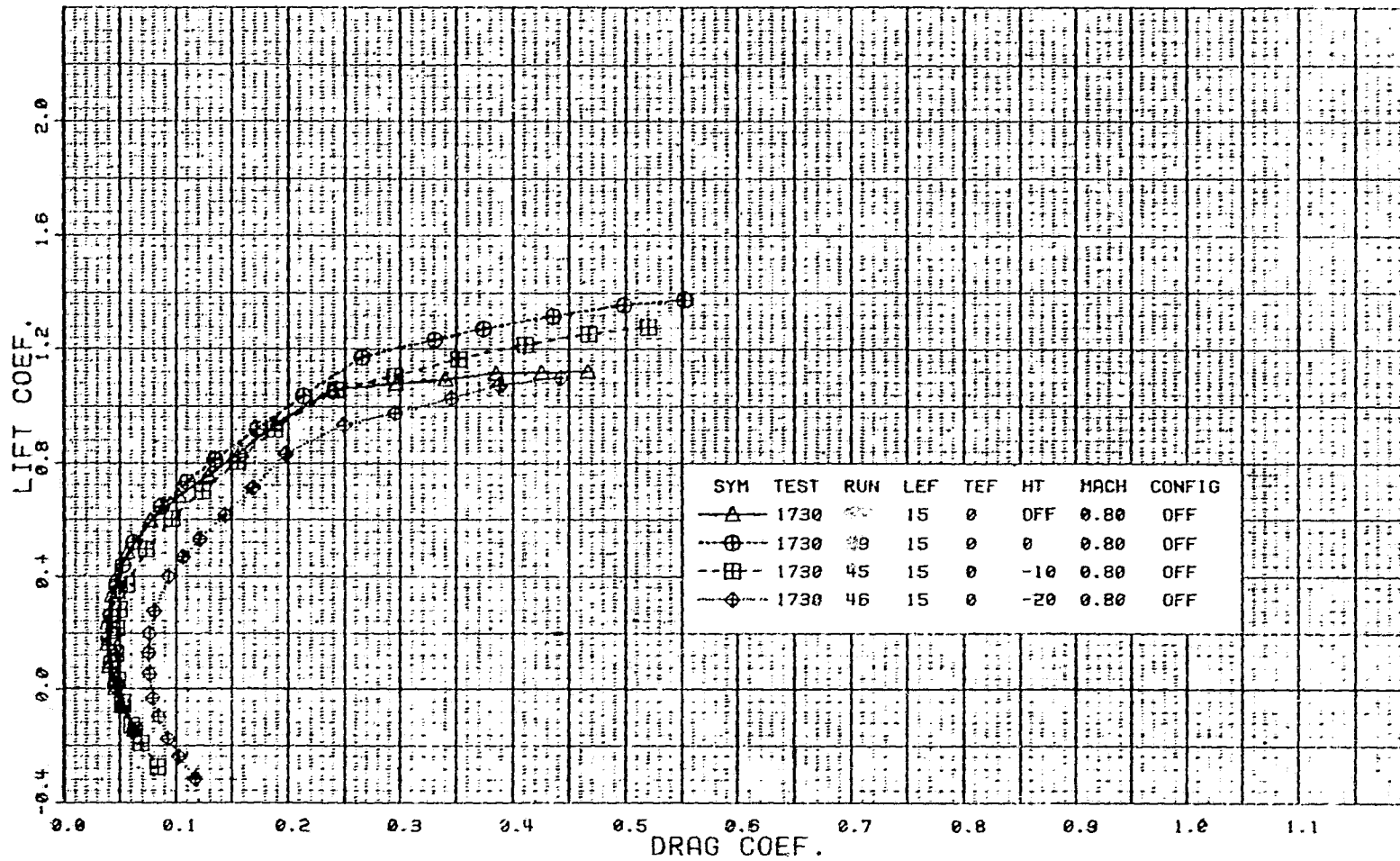
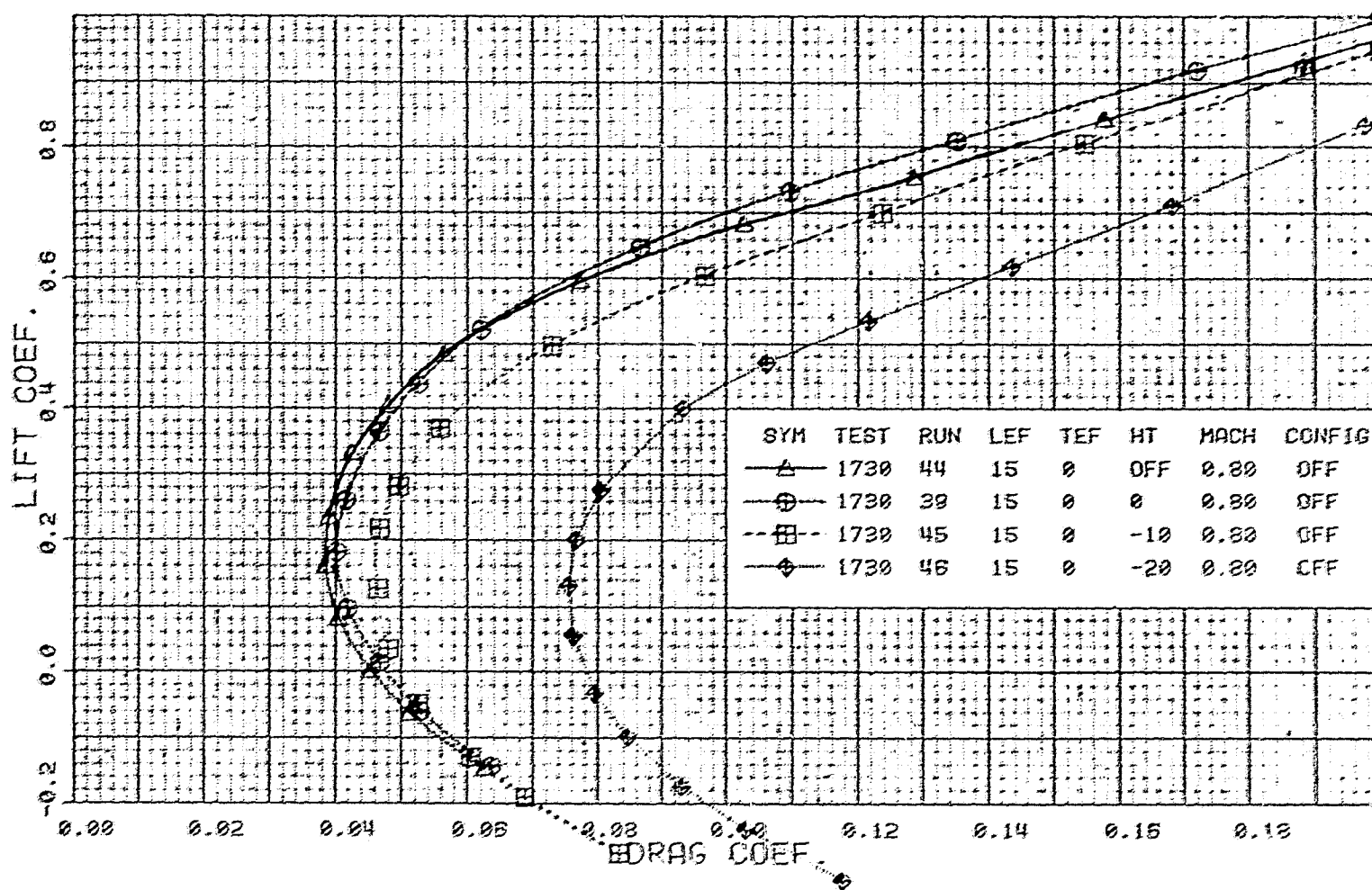


Figure 3-29 (b) Drag, Large Scale



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Figure 3-29 (c) Drag, Small Scale

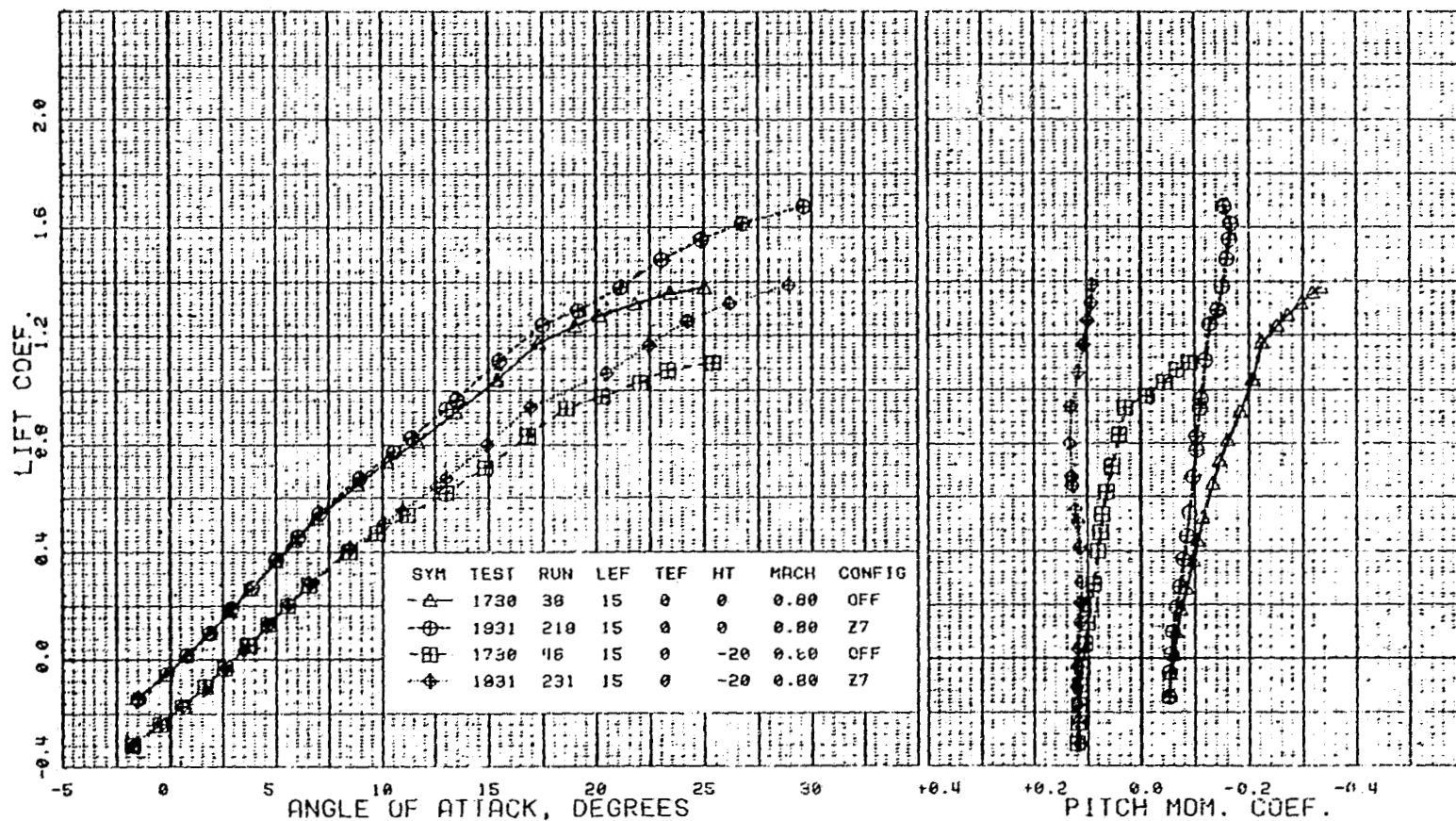
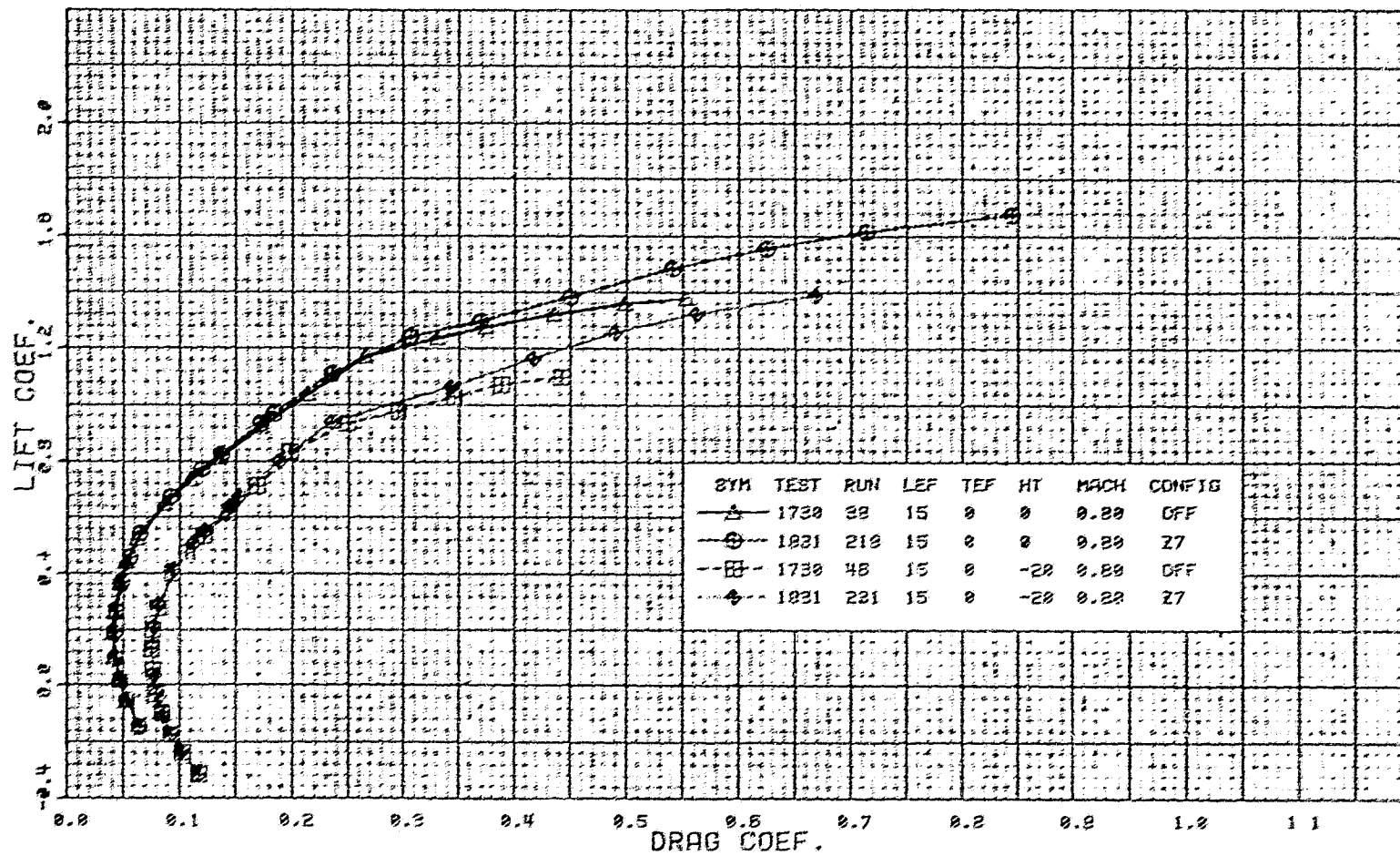


Figure 3-30 Effect of Strake Z7 on Horizontal Tail Effectiveness,
Configuration 785, $M = 0.80$
(a) Lift and Pitching Moment



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Figure 3-30 (b) Drag, Large Scale

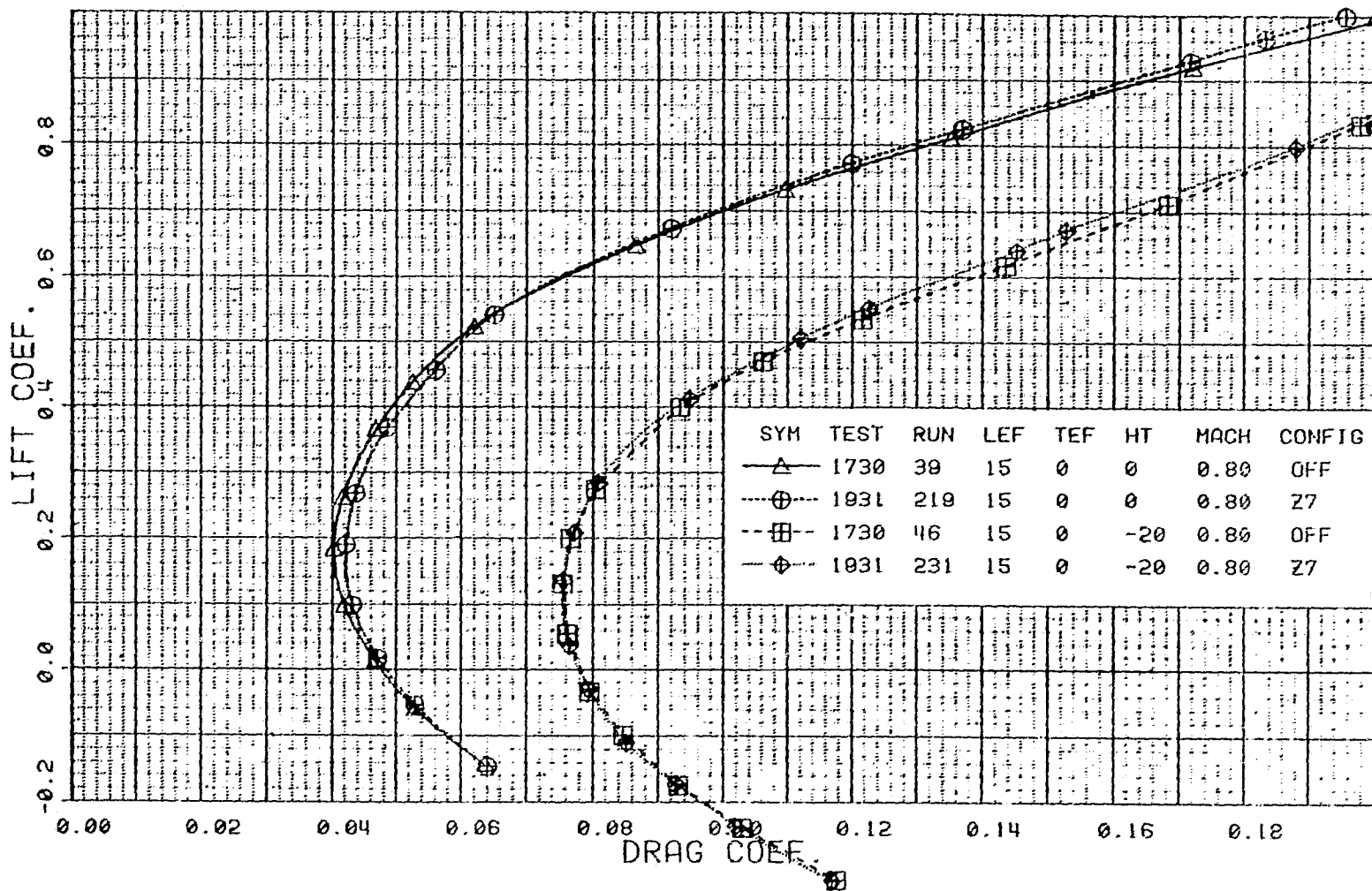


Figure 3-30 (c) Drag, Small Scale

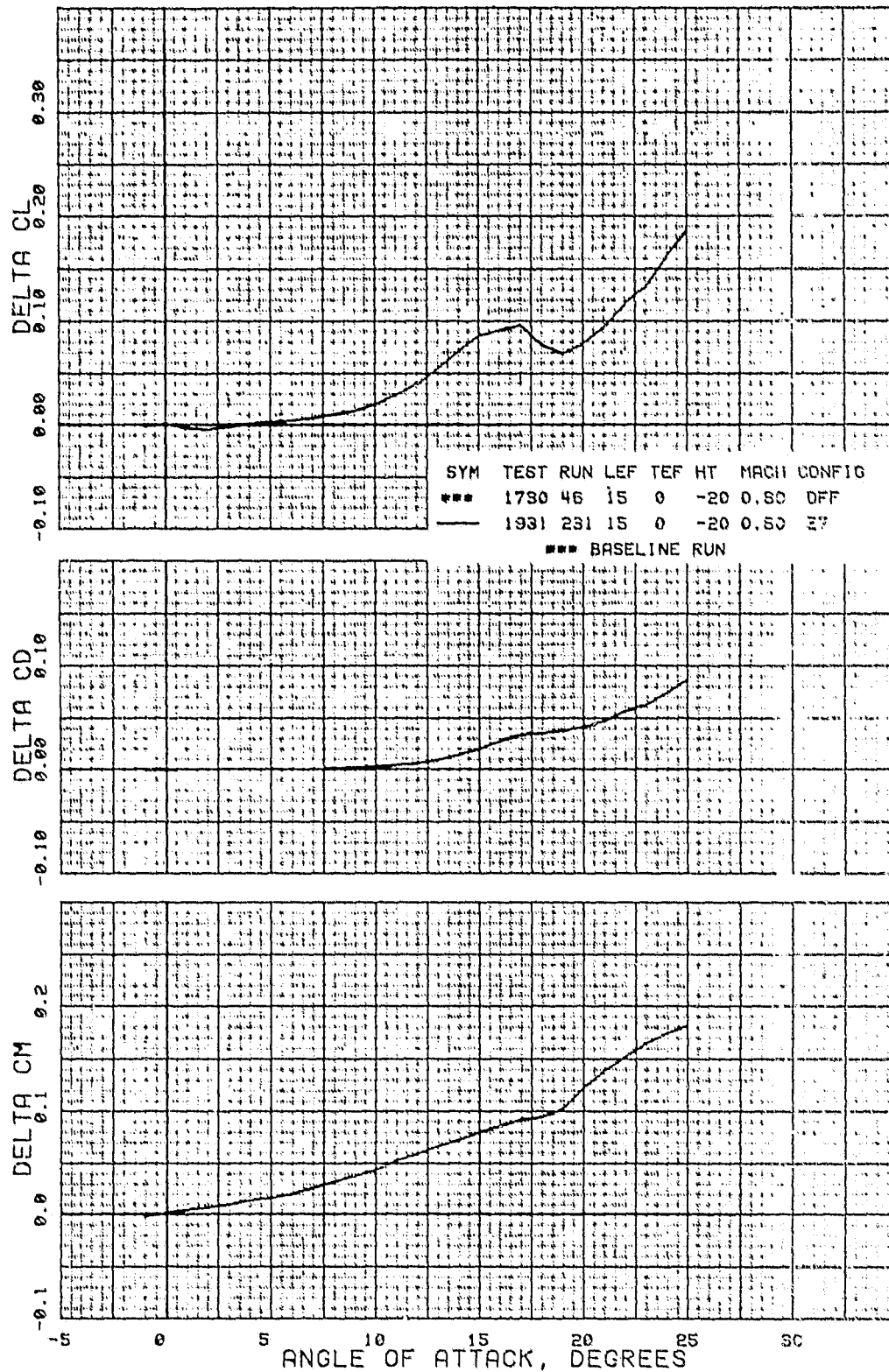


Figure 3-30 (d) Increments

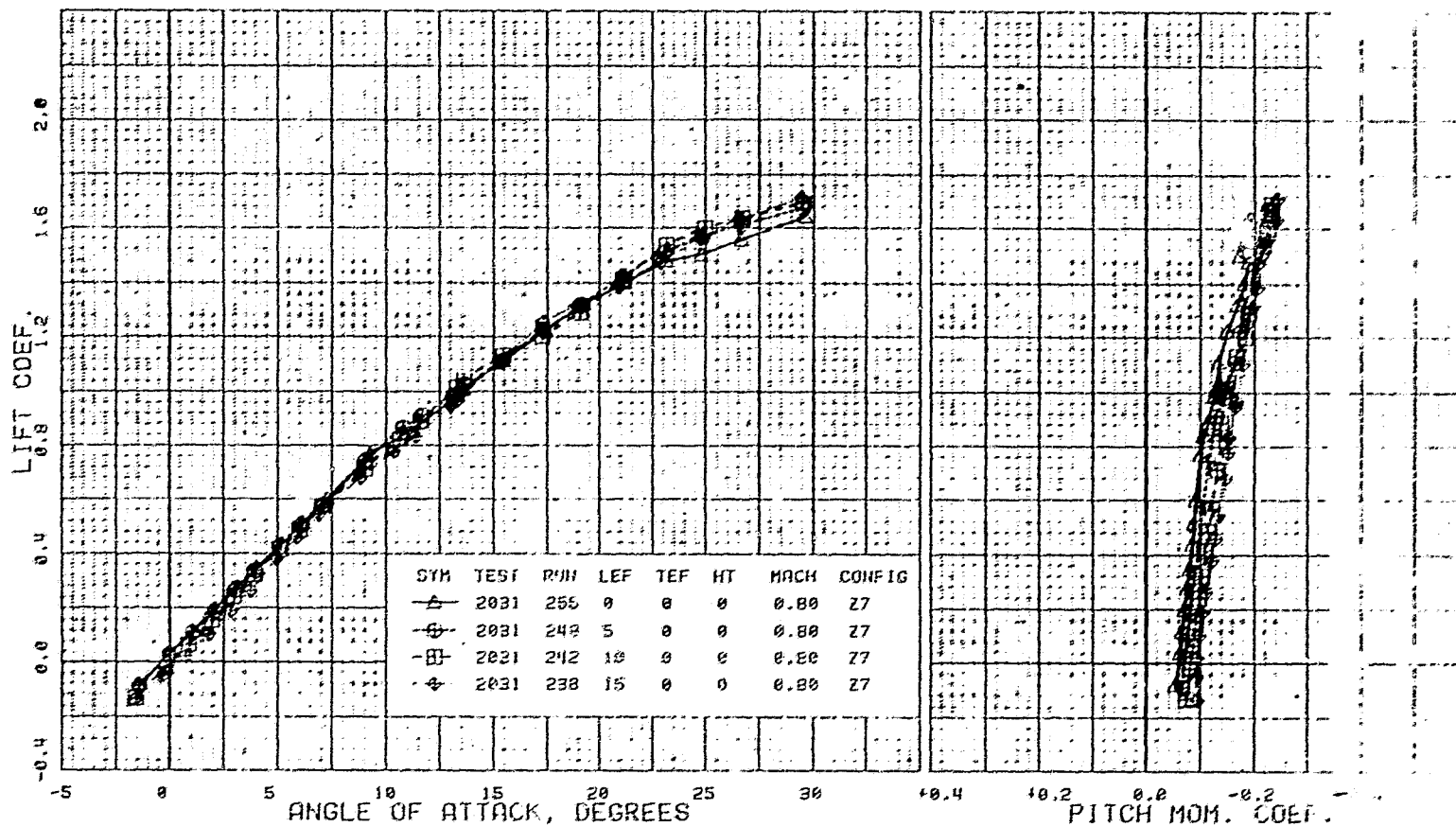


Figure 3-31 Effect of Leading Edge Flap Deflection With Strake Z7,
Configuration 785, $M = 0.80$
(a) Lift and Pitching Moment

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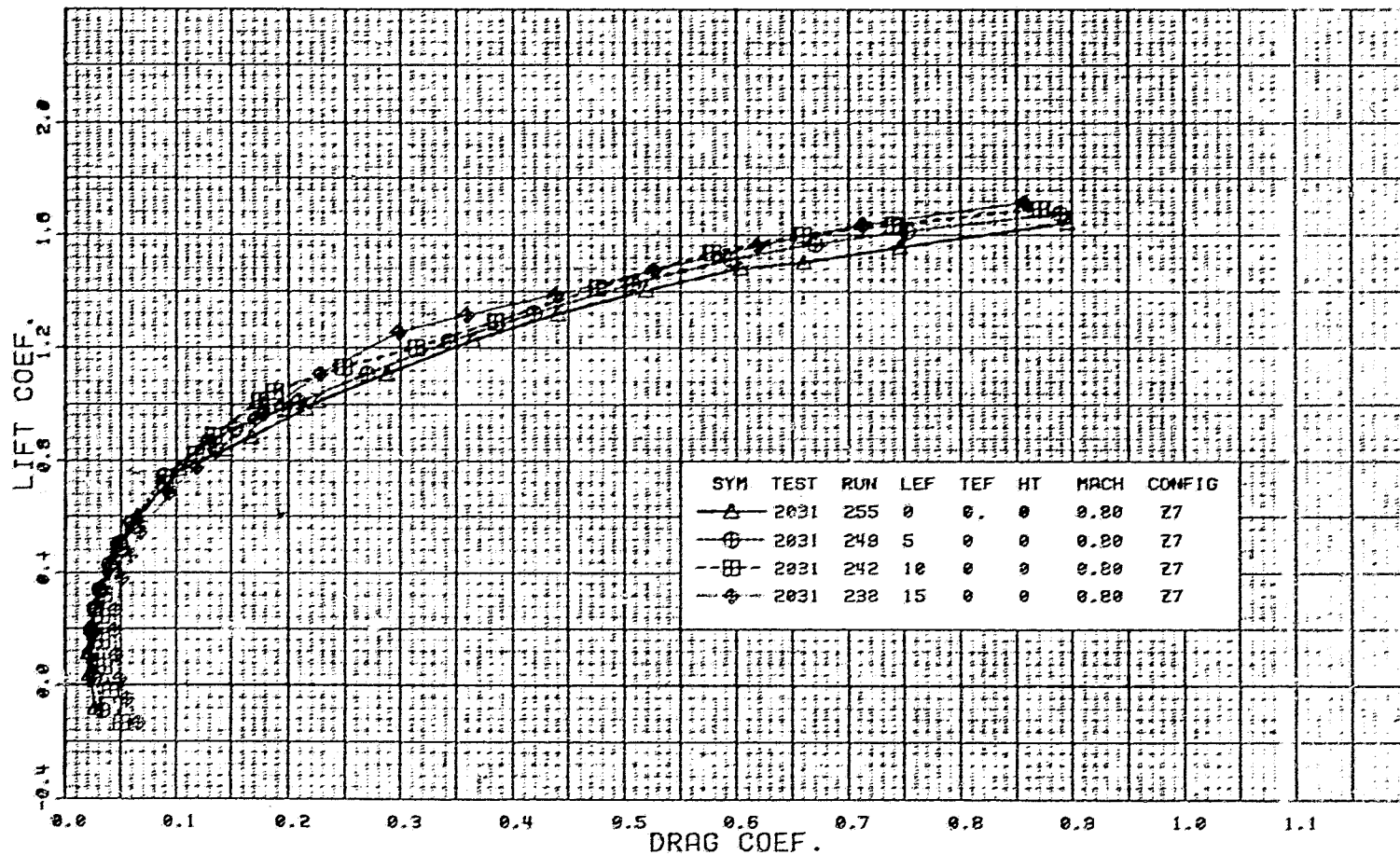


Figure 3-31 (b) Drag, Large Scale

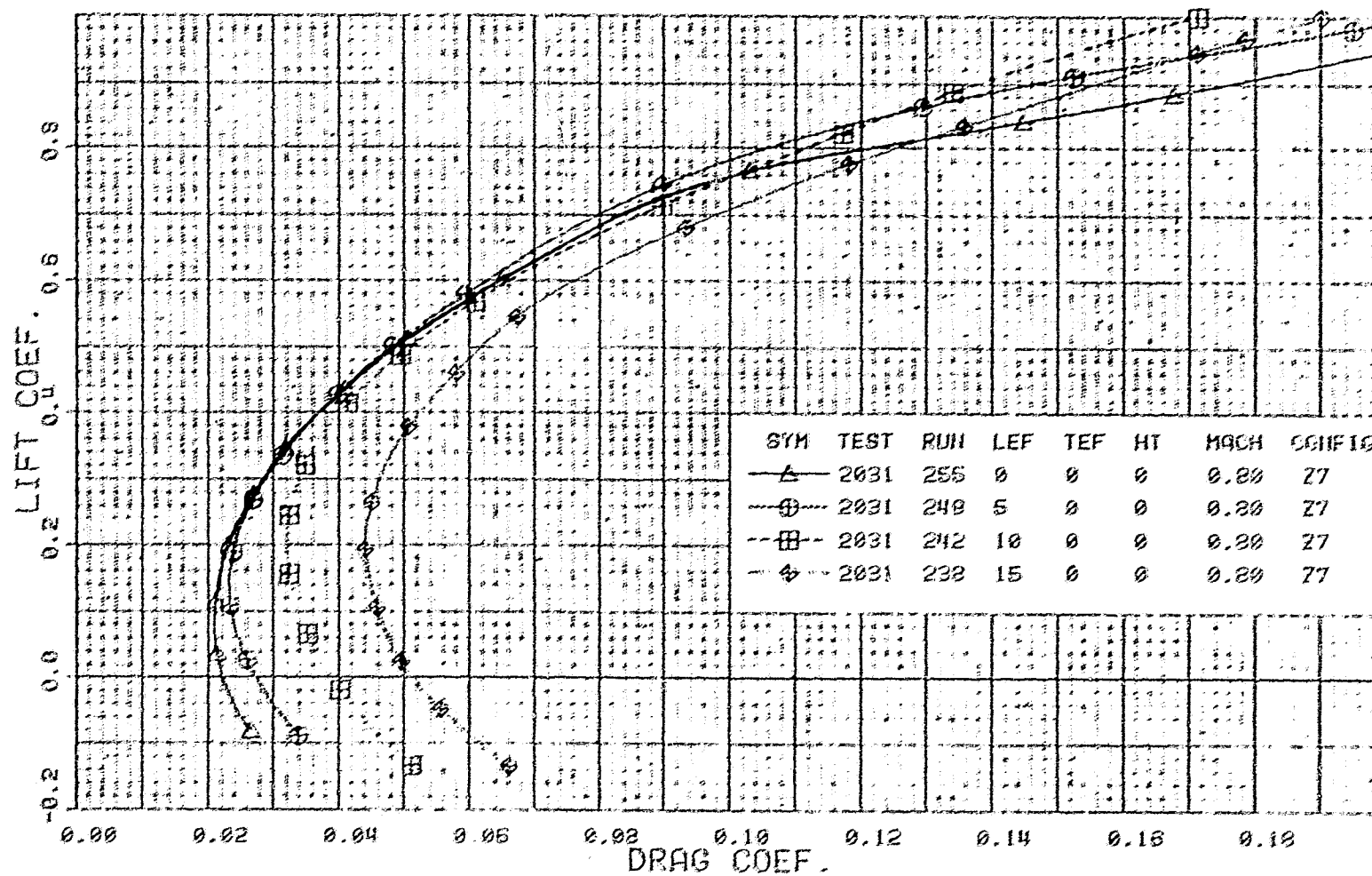


Figure 3-31 (c) Drag, Small Scale

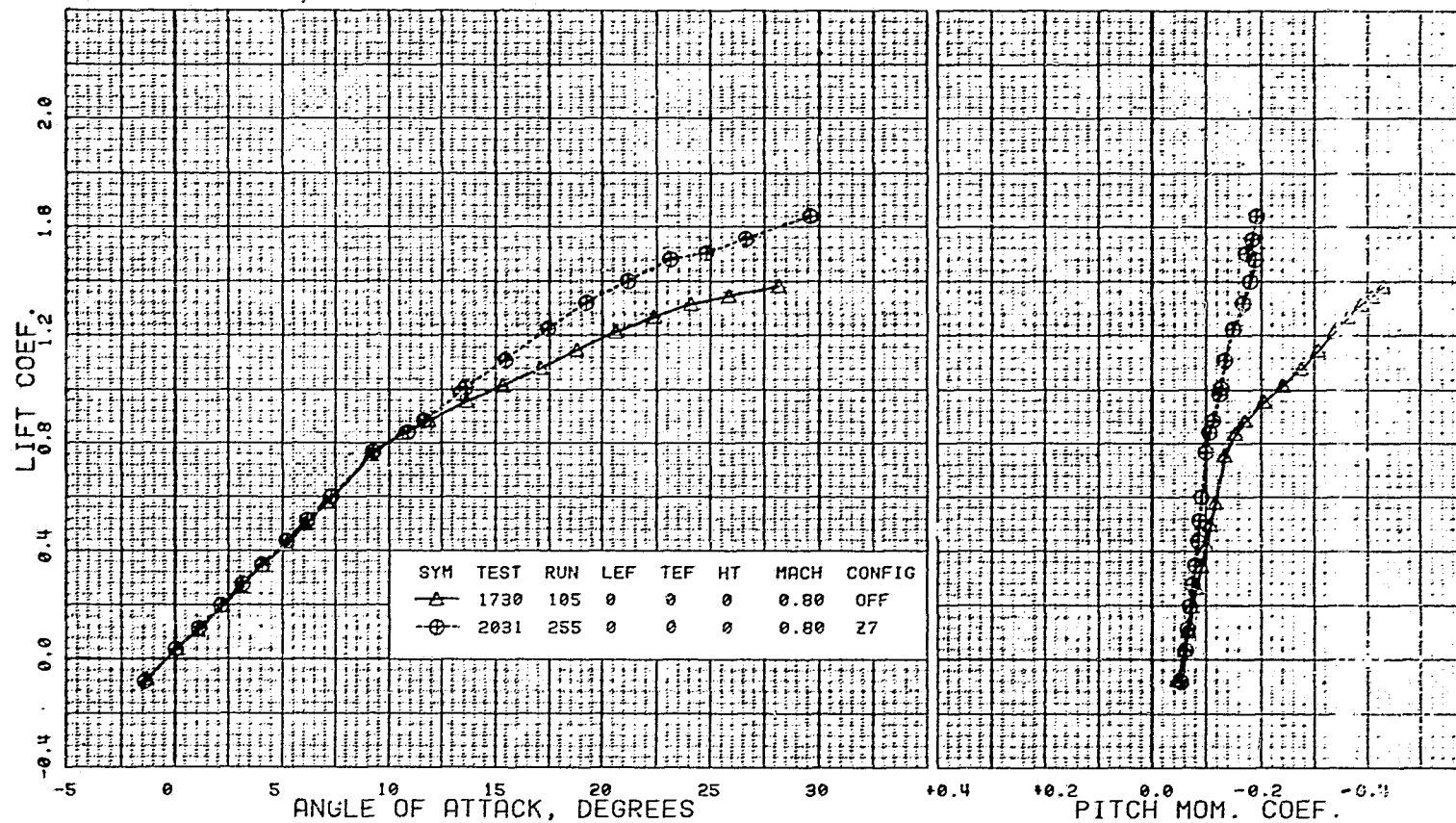
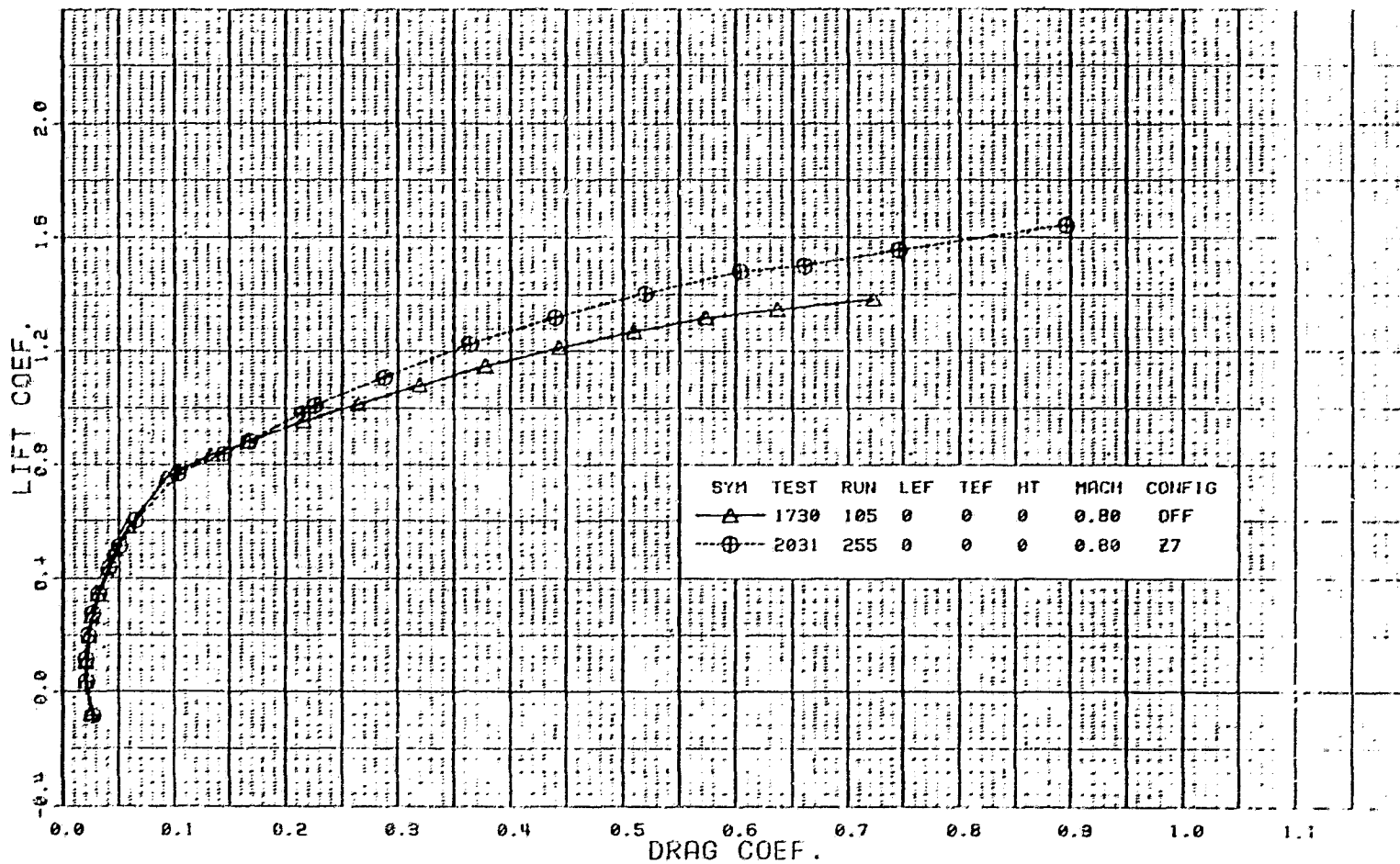
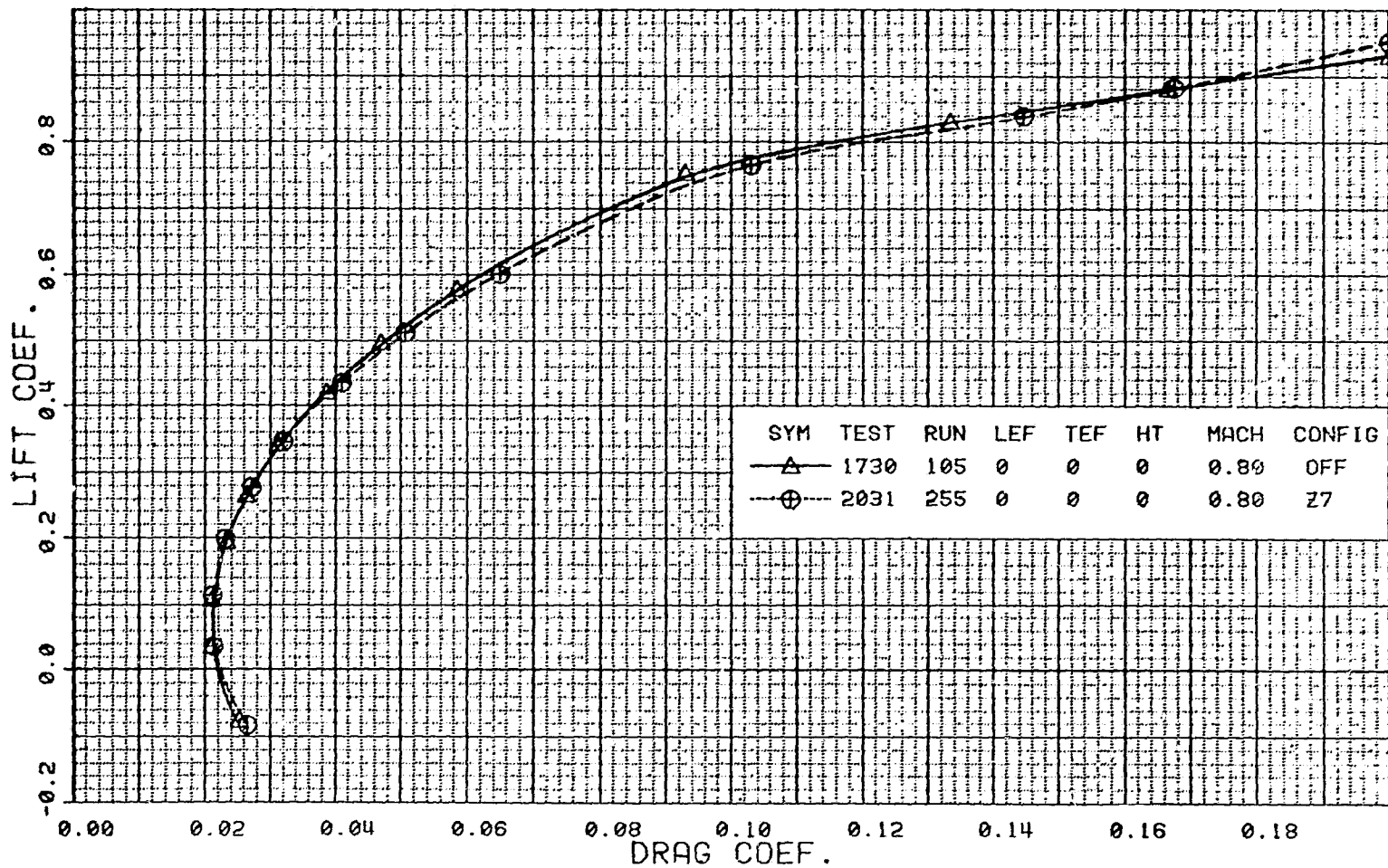


Figure 3-32 Effect of Forebody Strake Z7, Configuration 786,
LEF = 0. M = 0.80
(a) Lift and Pitching Moment

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• Figure 3-32 (b) Drag, Large Scale



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Figure 3-32 (c) Drag, Small Scale

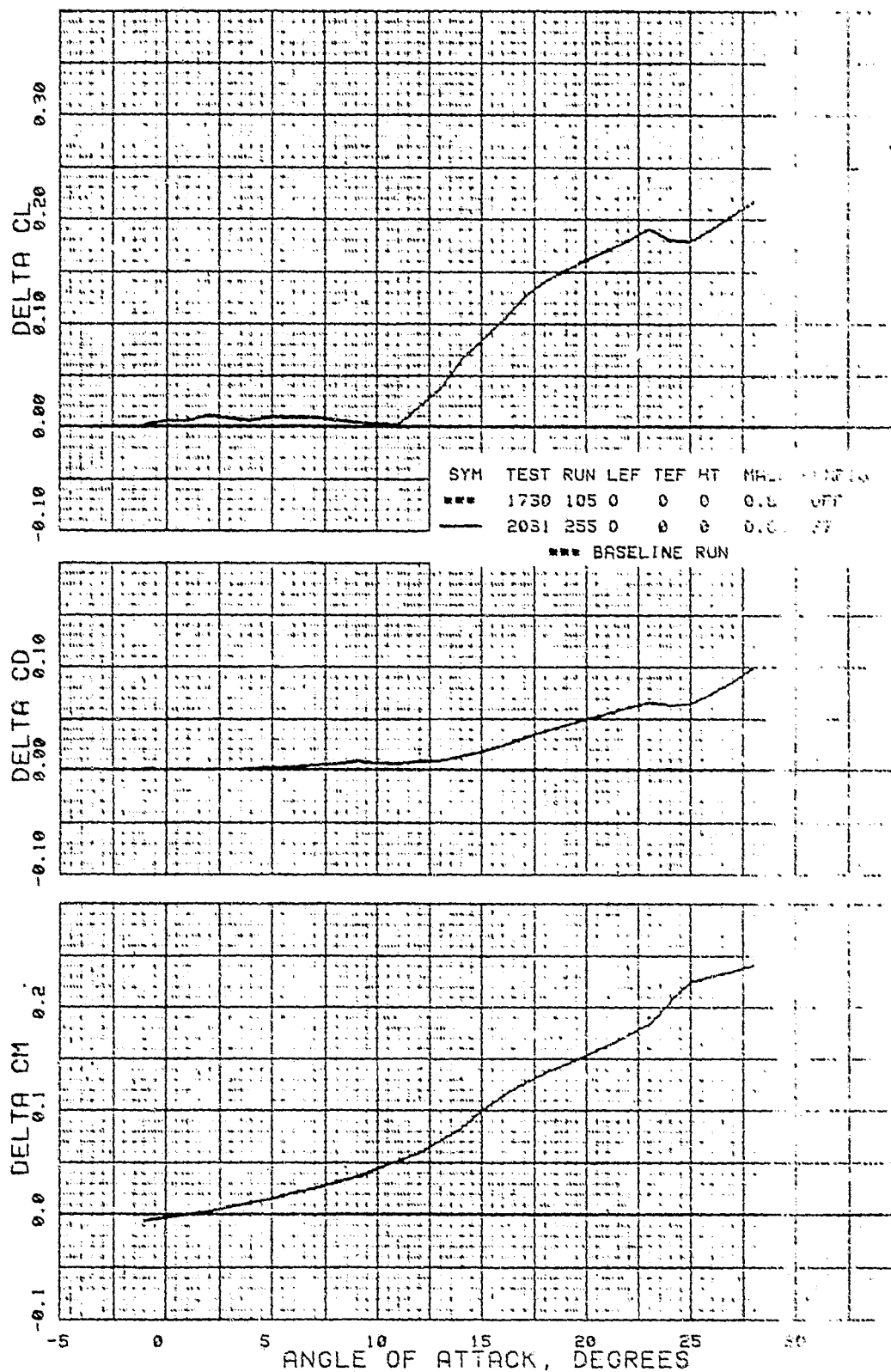


Figure 3-32 (d) Increments

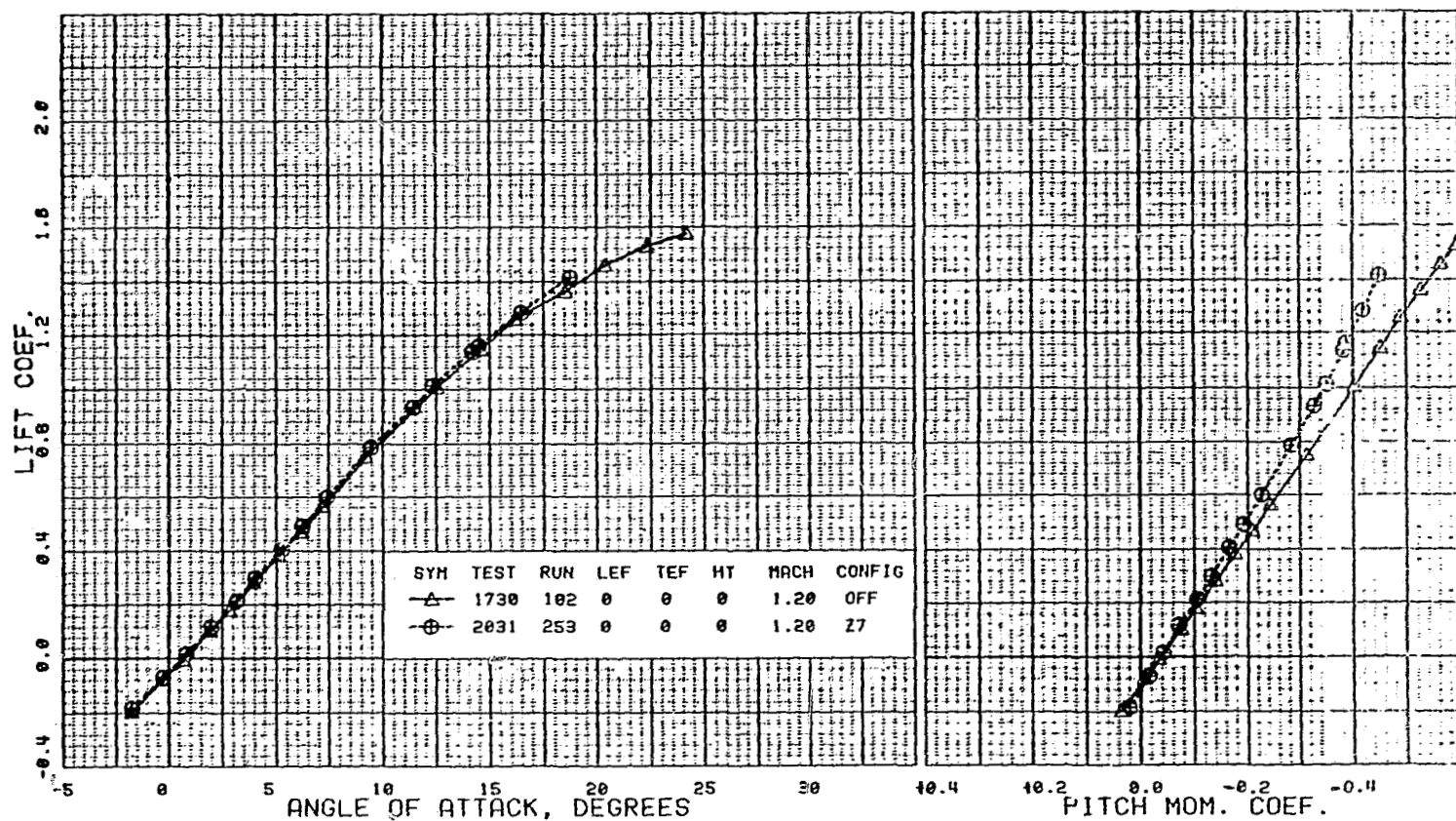


Figure 3-33 Effect of Forebody Strake Z7, Configuration 786, $M = 1.20$
(a) Lift and Pitching Moment

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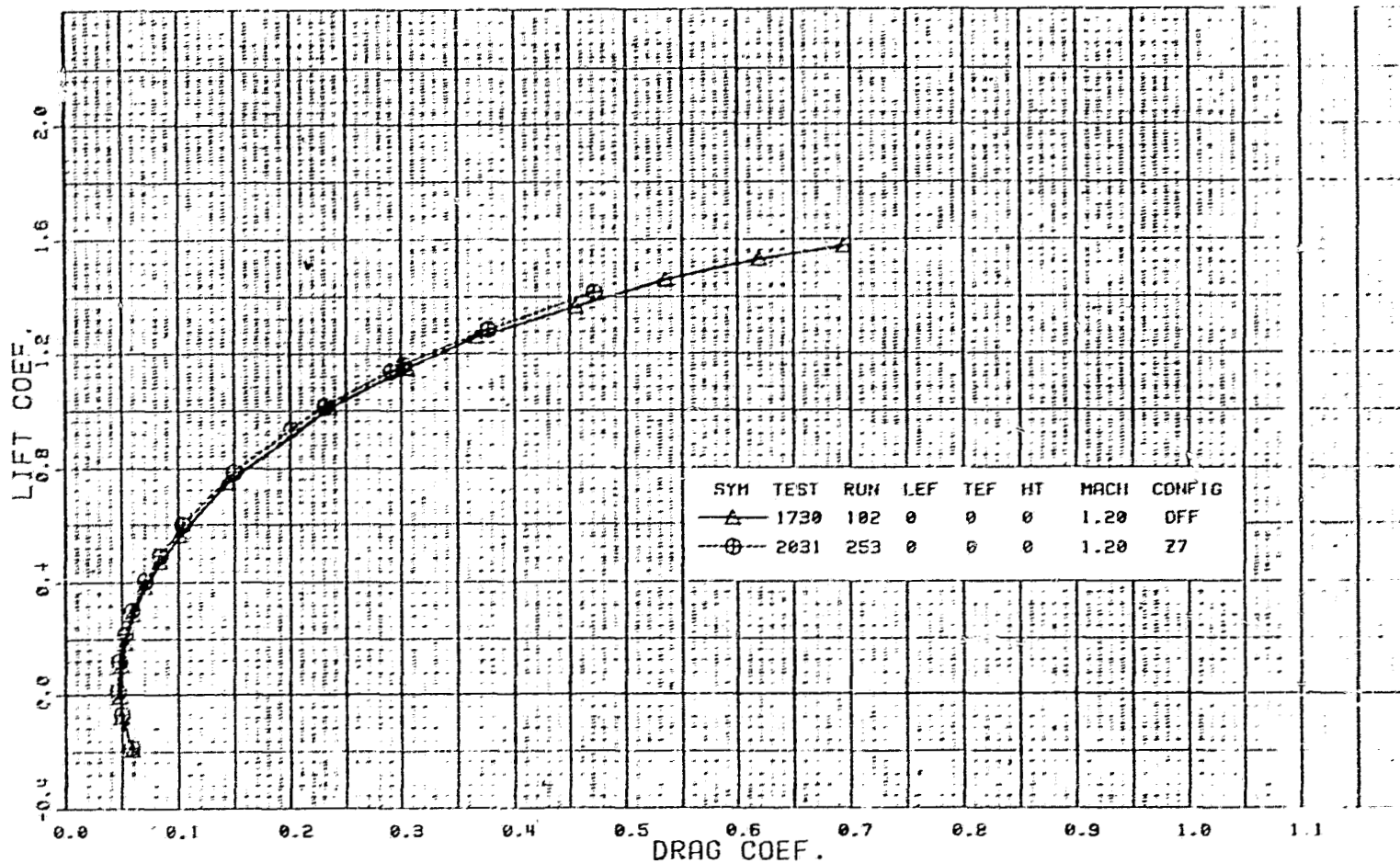


Figure 3-33 (b) Drag, Large Scale

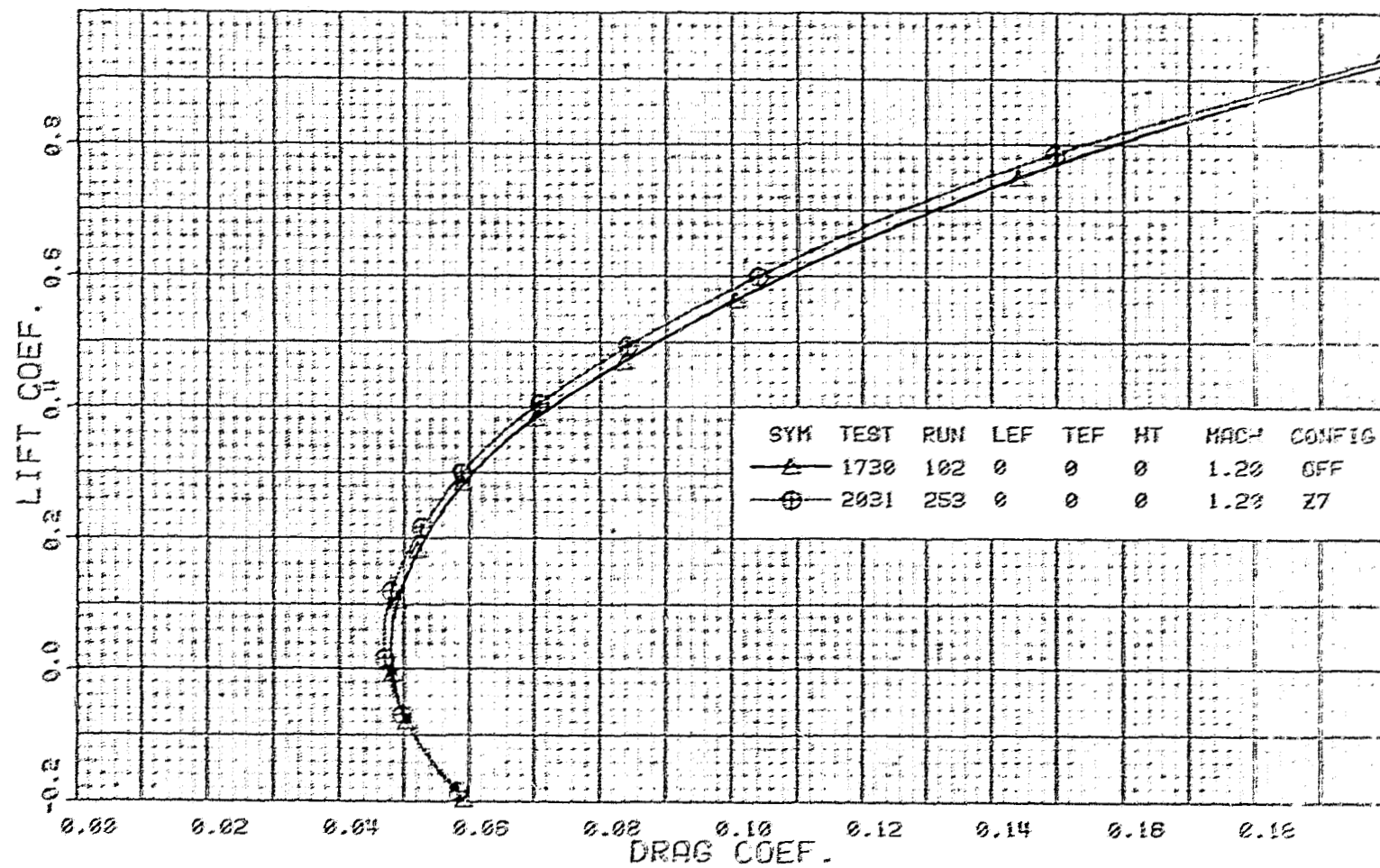


Figure 3-33 (c) Drag, Small Scale

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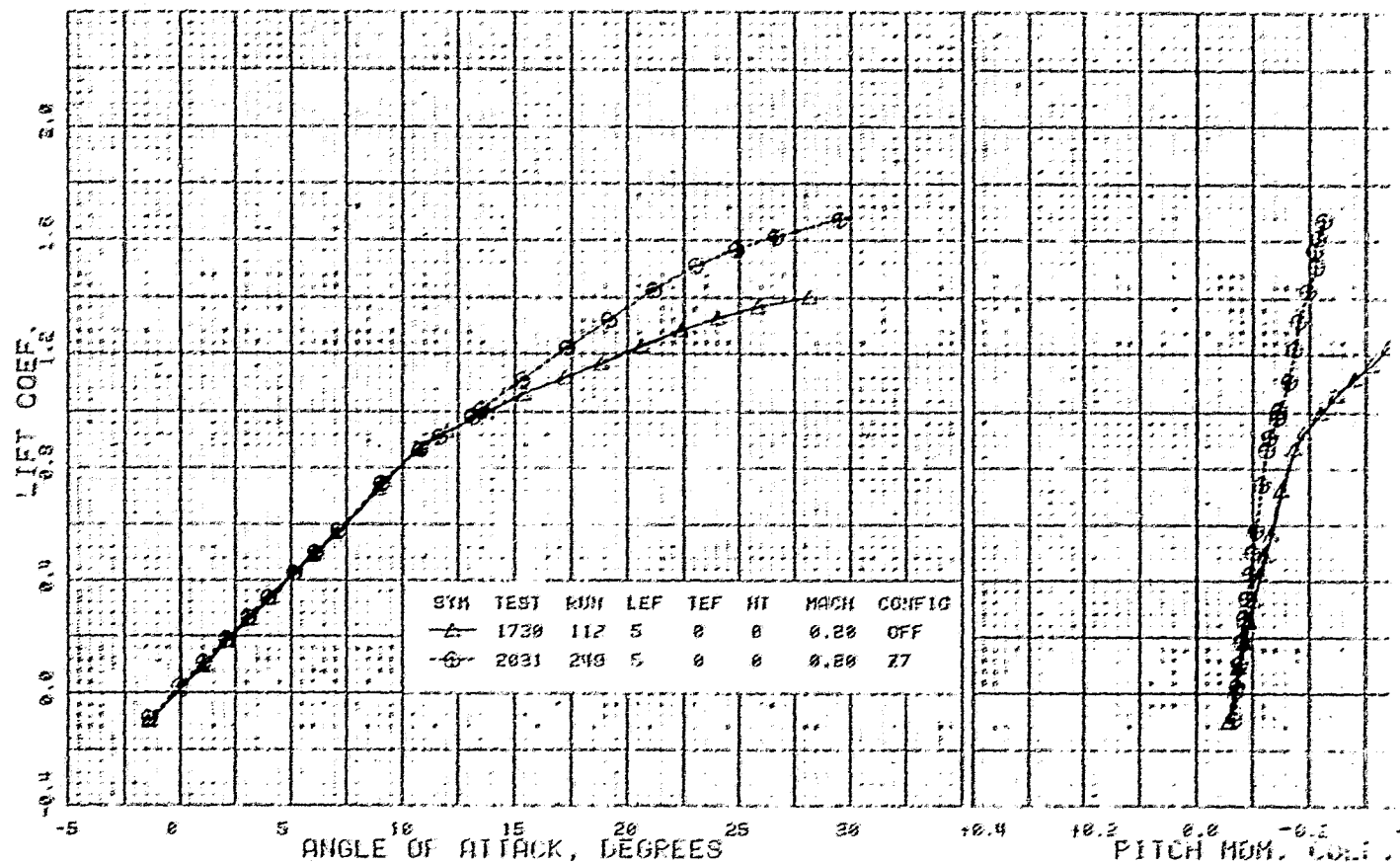


Figure 3-34 Effect of Forebody Strake Z7, Configuration 786, LEF = 5° ,
M = 0.80
(a) Lift and Pitching Moment

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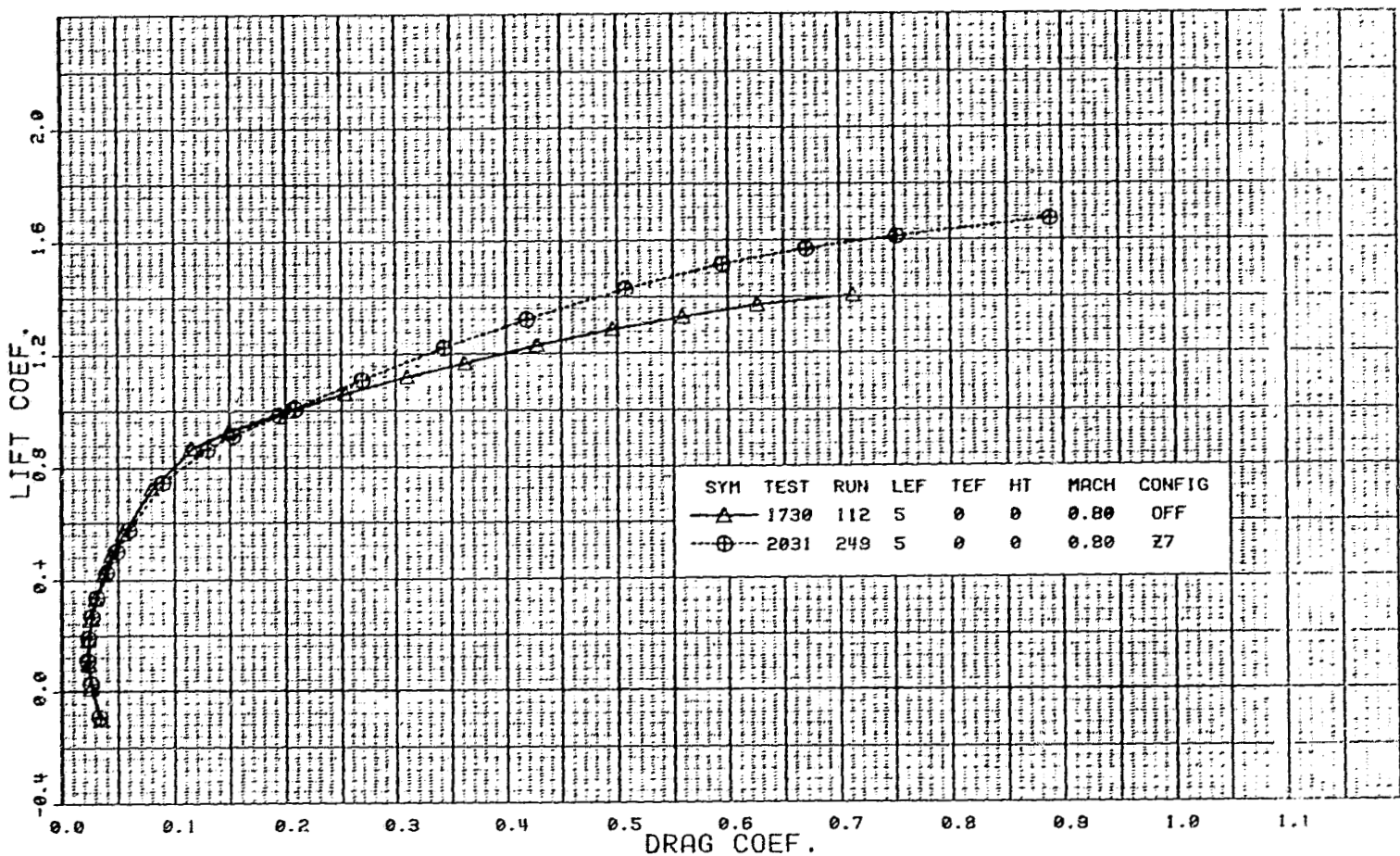


Figure 3-34 (b) Drag, Large Scale

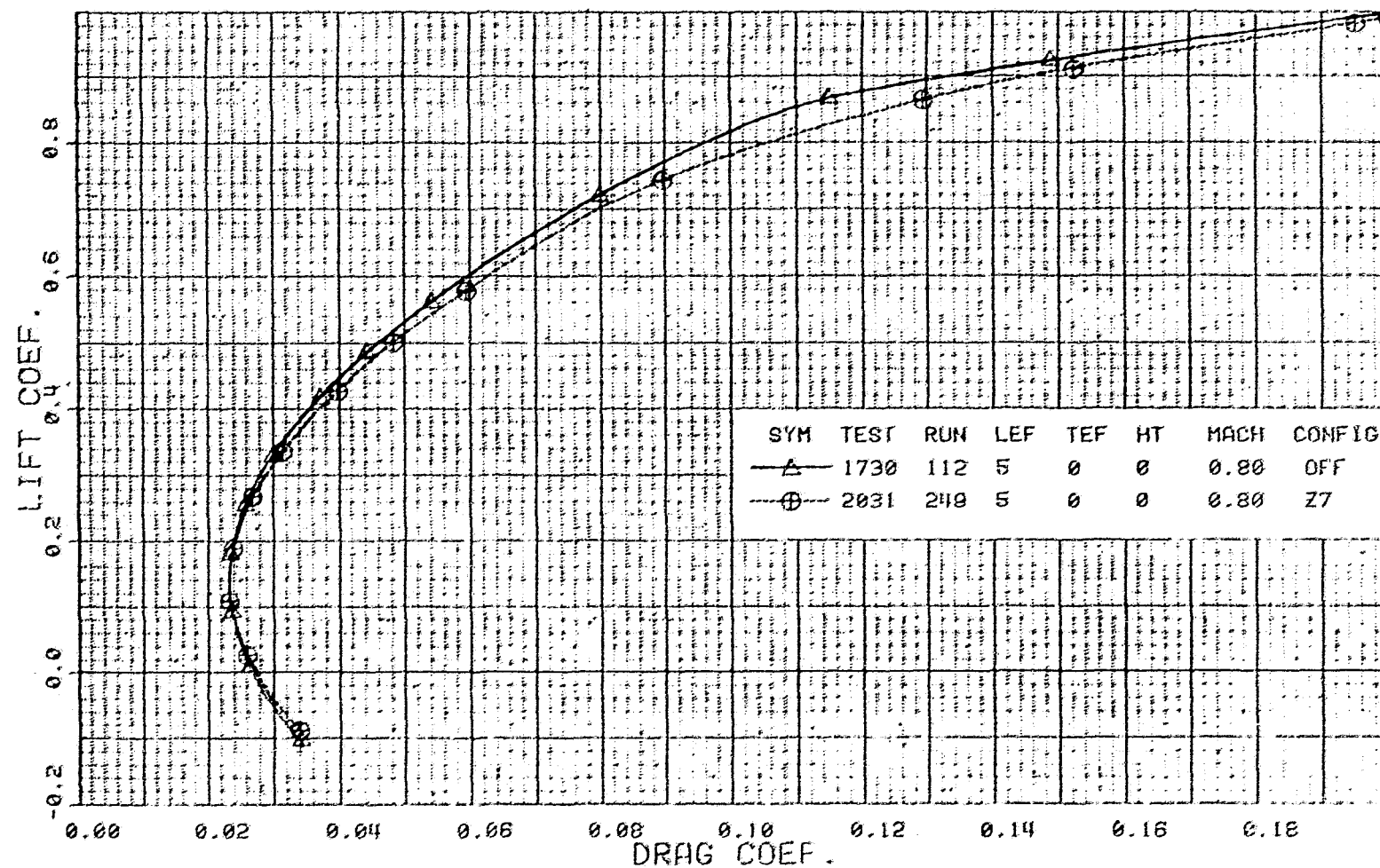


Figure 3-34 (c) Drag, Small Scale

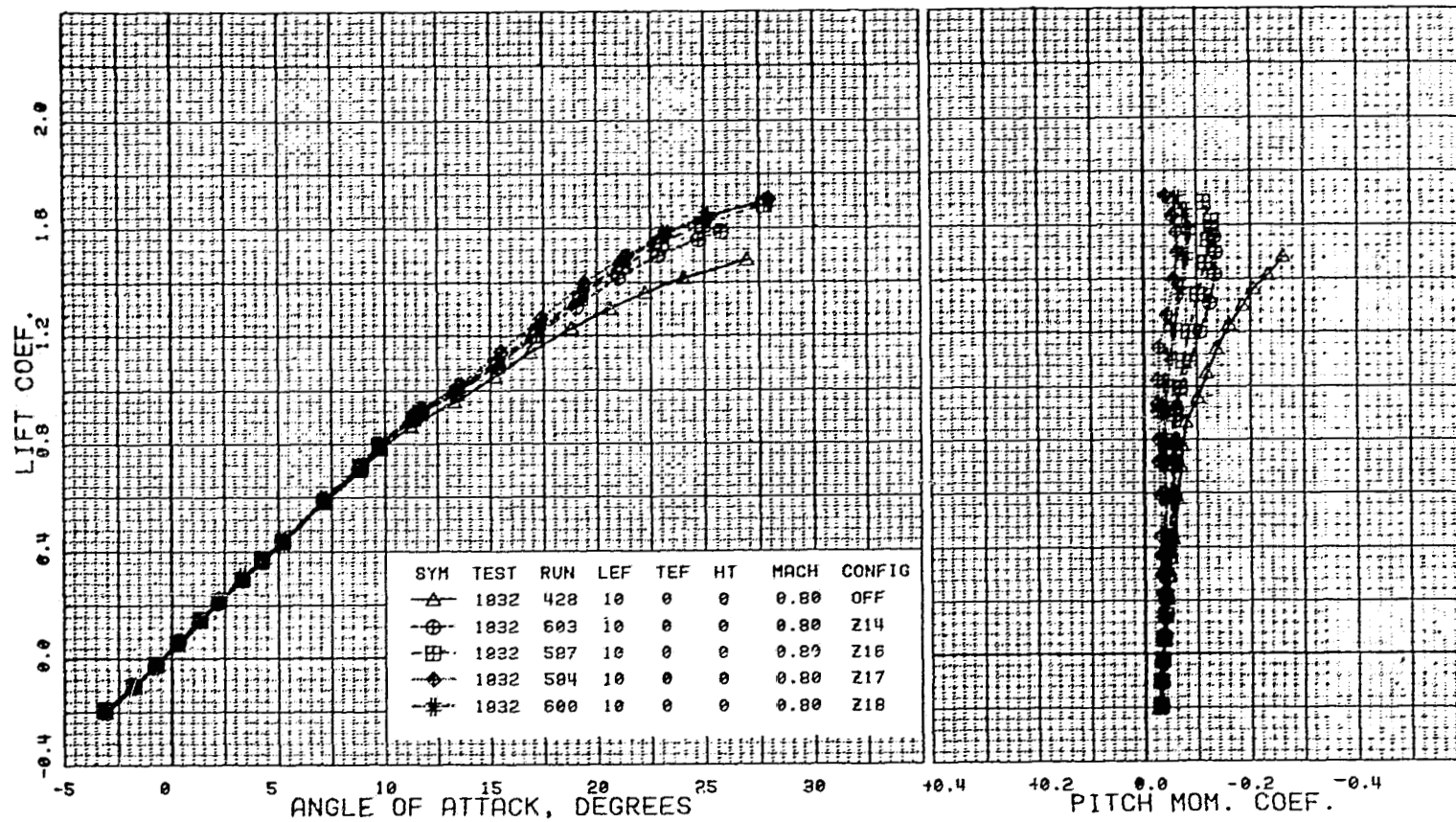


Figure 3-35 Effect of Ogee Planform Forebody Strakes (Z14, Z16-Z18),
Configuration 401F-5, $M = 0.80$
(a) Lift and Pitching Moment

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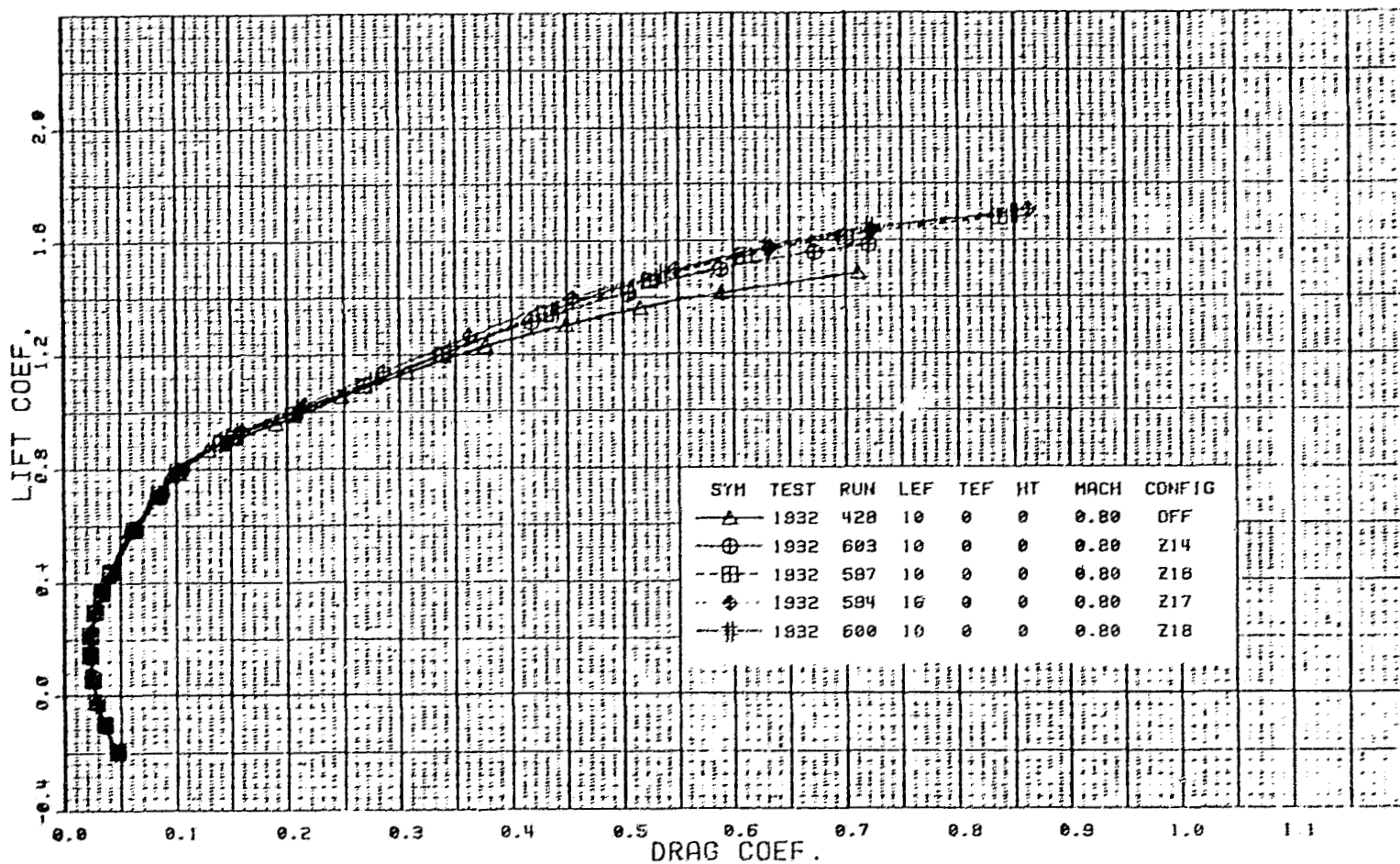


Figure 3-35 (b) Drag, Large Scale

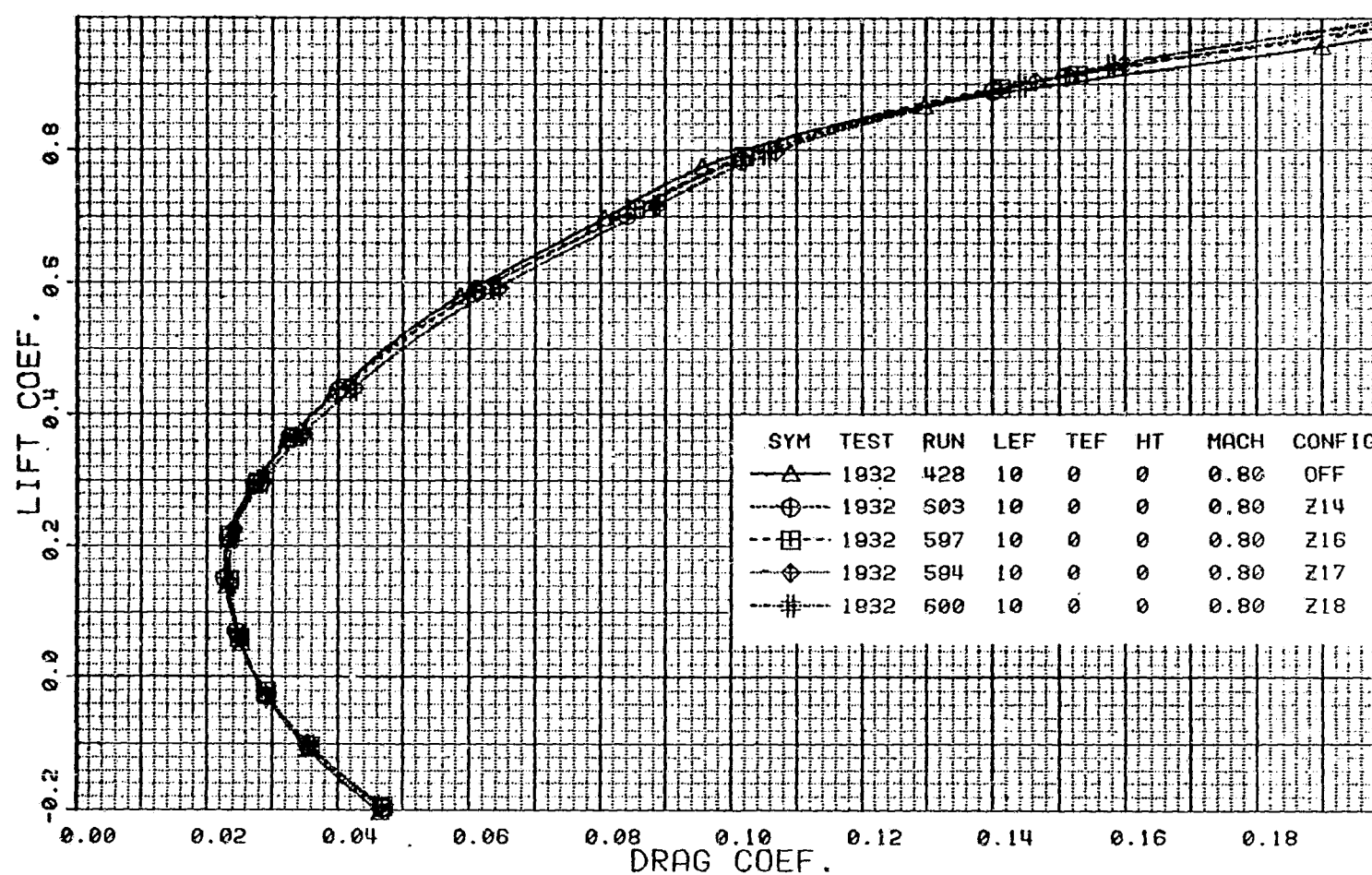


Figure 3-35 (c) Drag, Small Scale

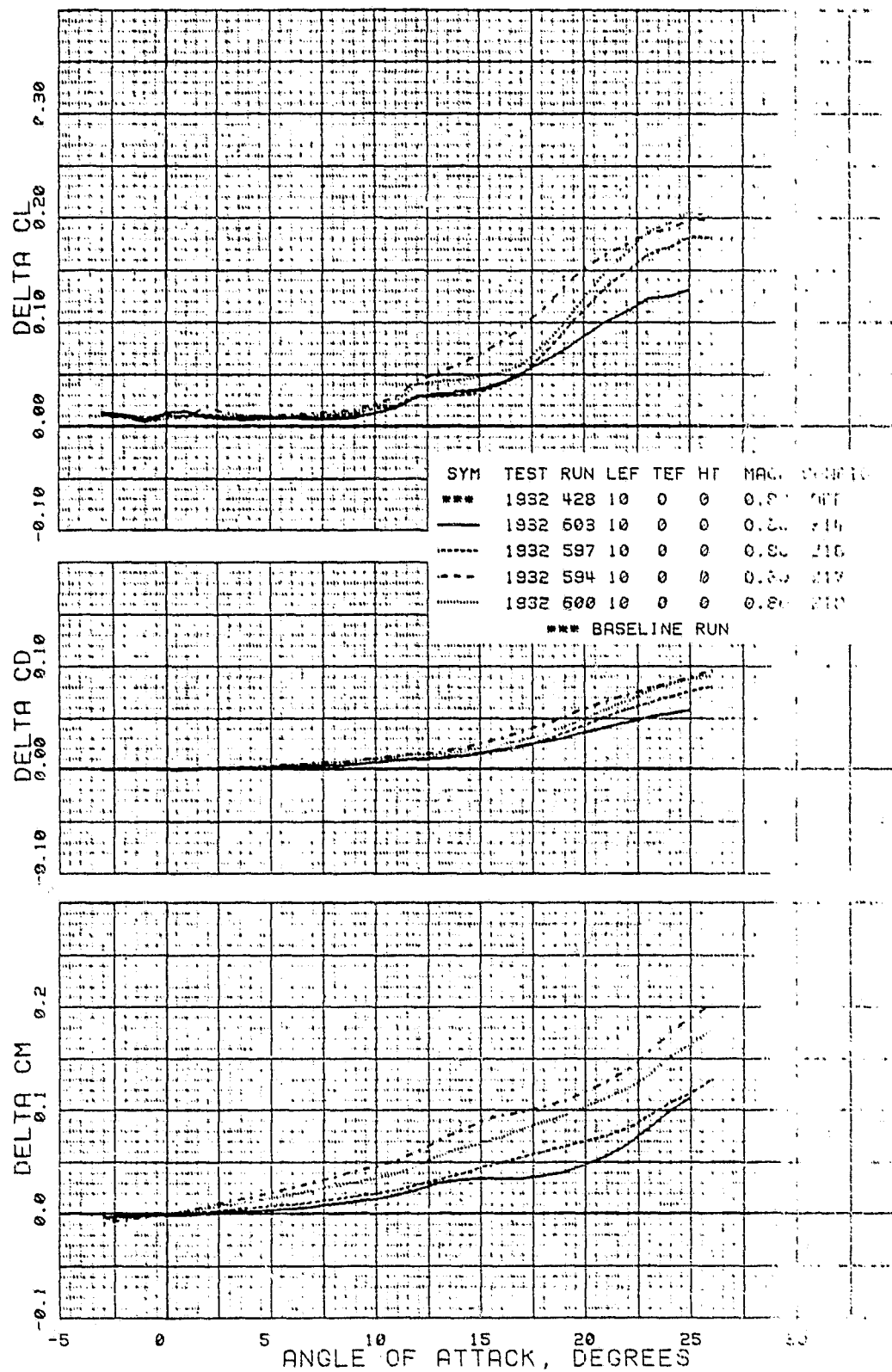


Figure 3-35 (d) Increments

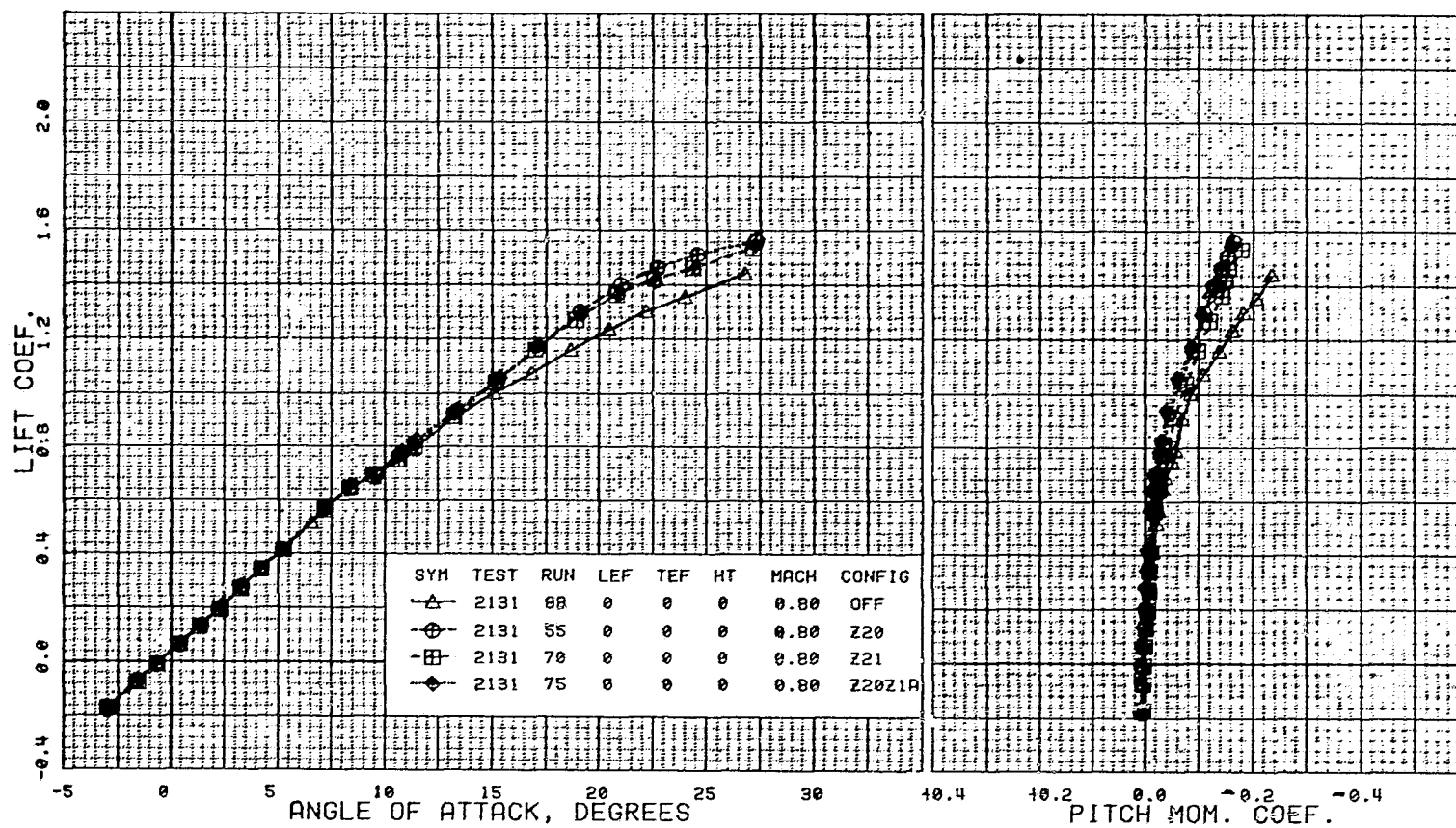


Figure 3-36 Effect of Forebody Chines (Z20,Z21) and Canard Strake Z1A,
Configuration 401F-10A, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

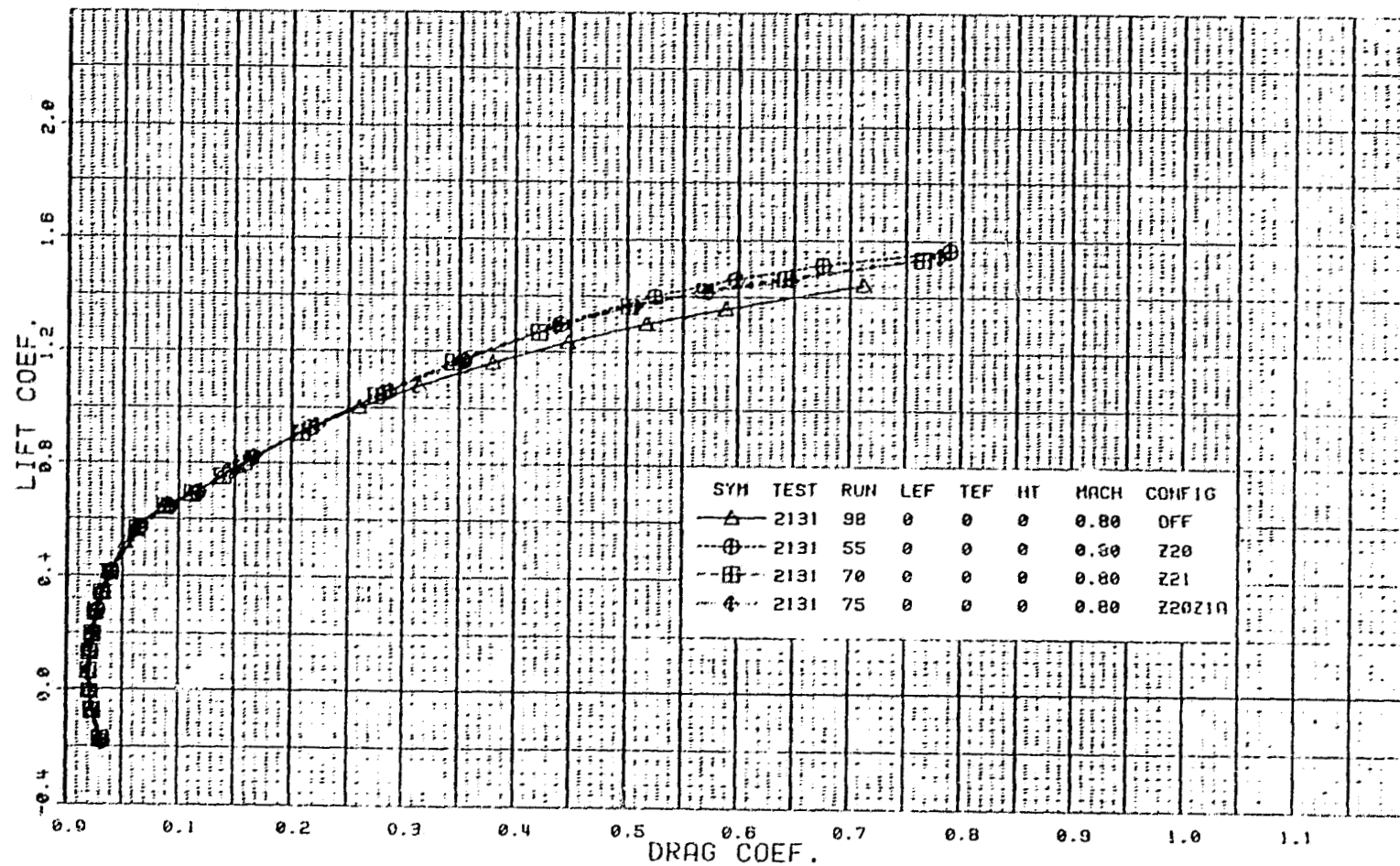


Figure 3-36 (b) Drag, Large Scale

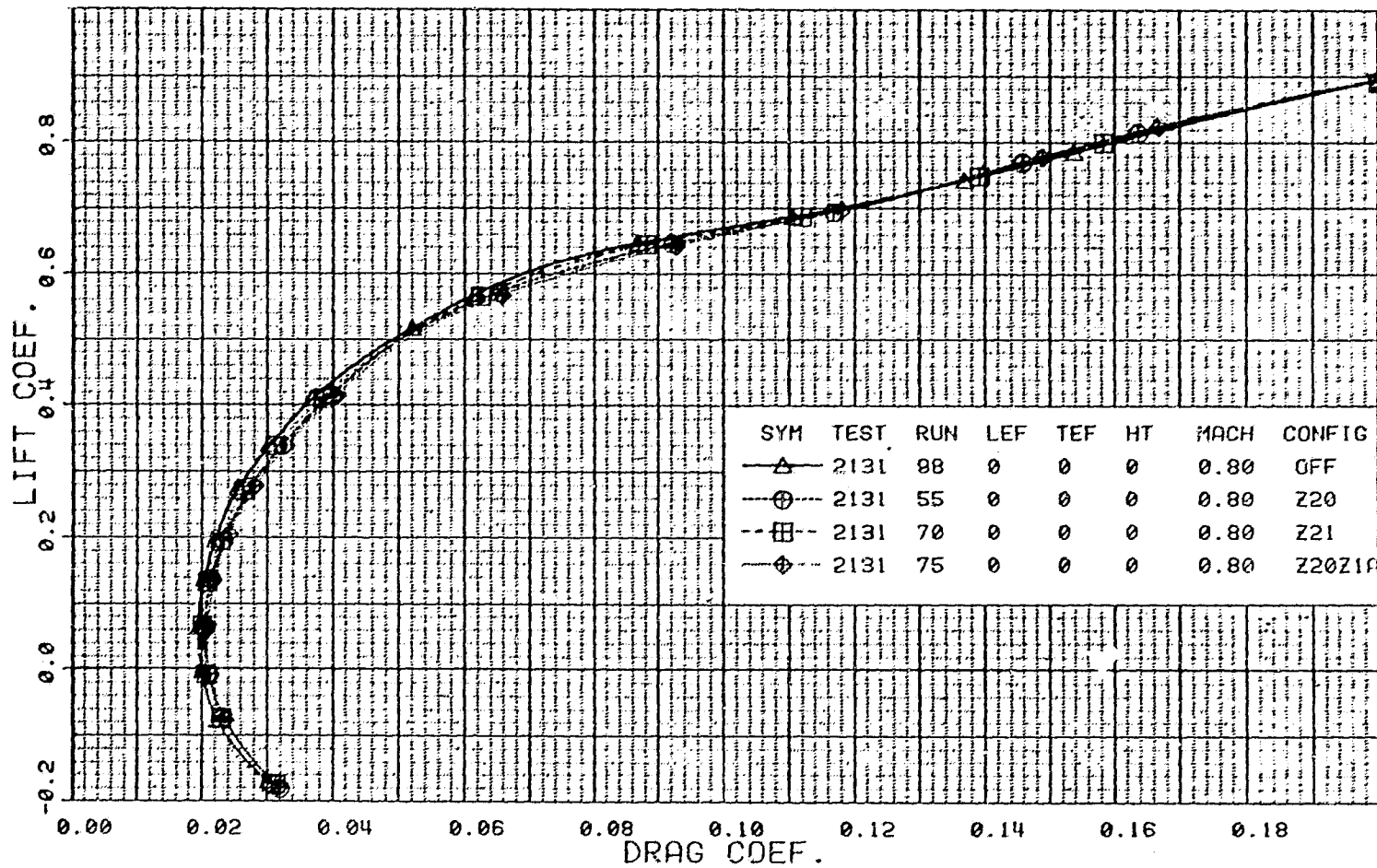


Figure 3-36 (c) Drag, Small Scale

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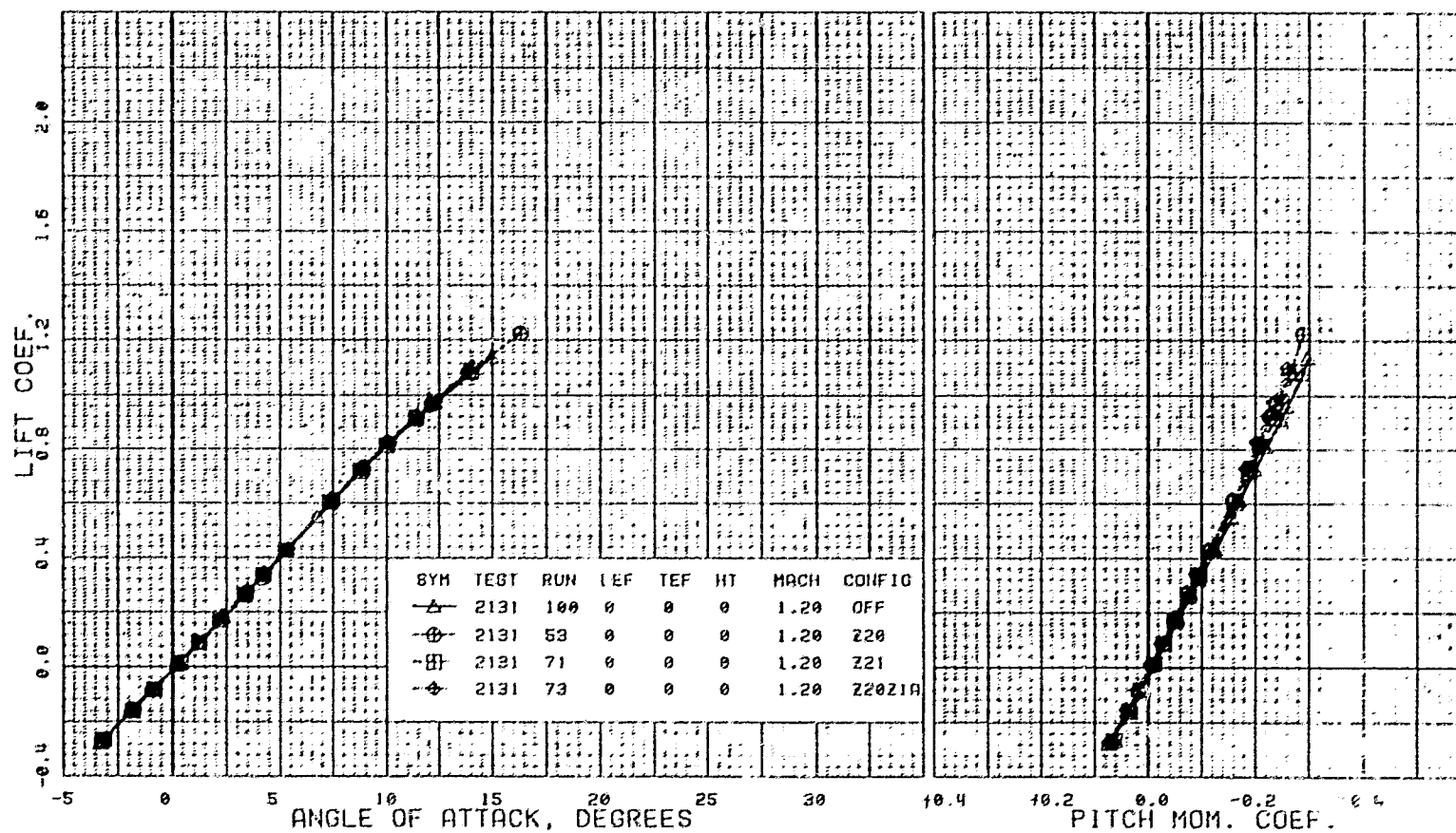


Figure 3-37 Effect of Forebody Chines (Z20, Z21) and Canard Strake Z1A, Configuration 401F-10A, $M = 1.20$
(a) Lift and Pitching Moment

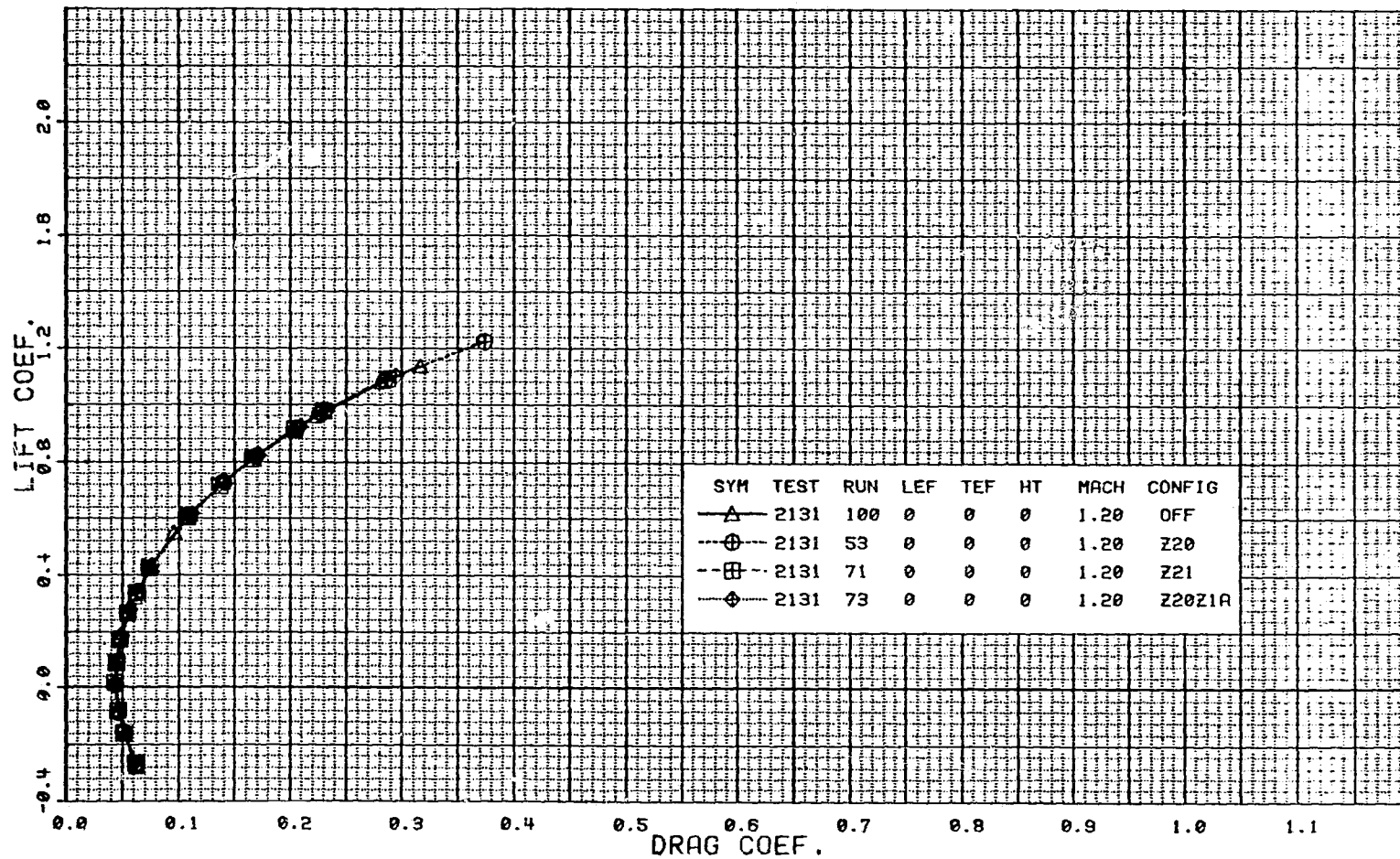


Figure 3-37 (b) Drag, Large Scale

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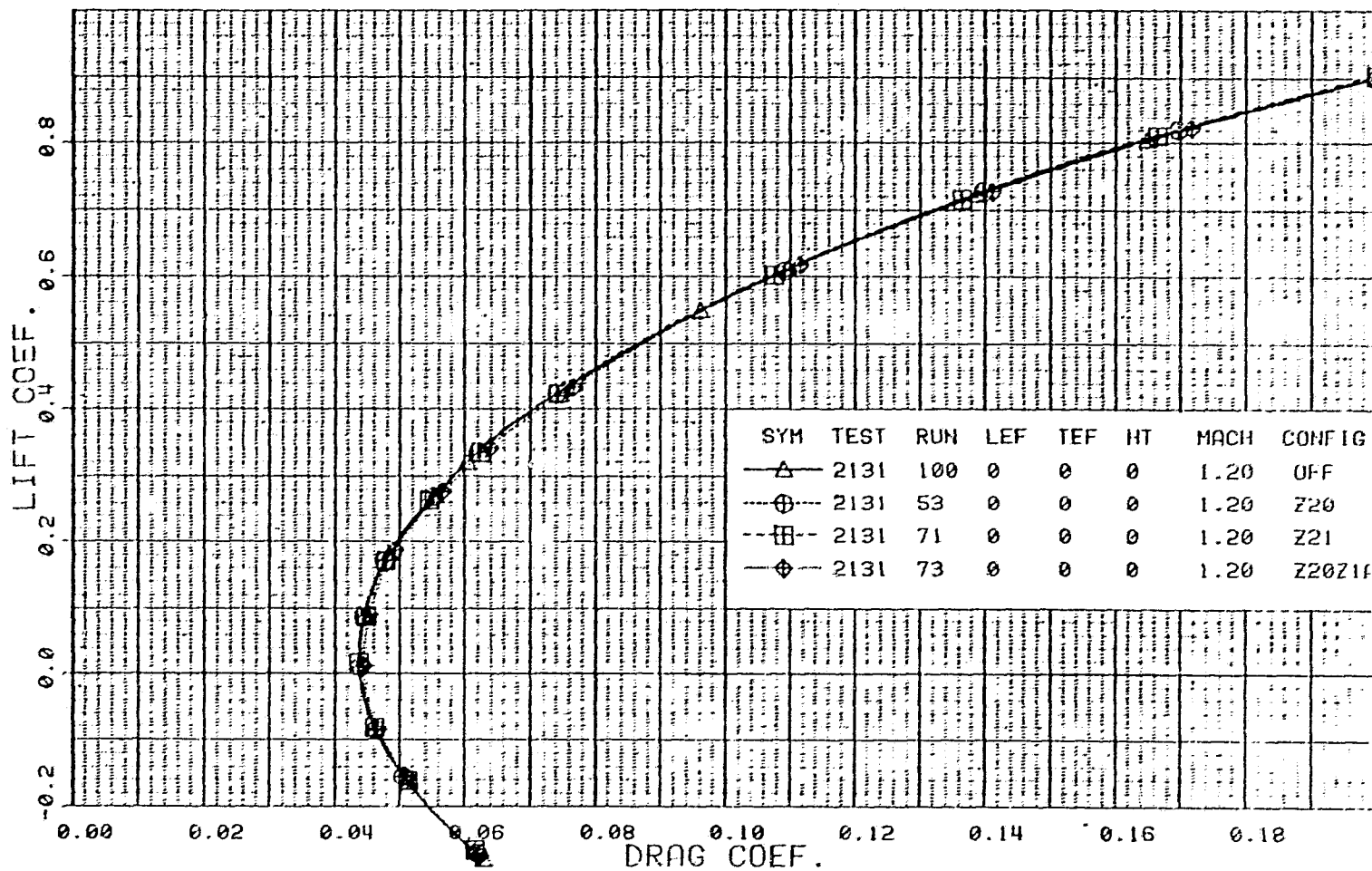


Figure 3-37 (c) Drag, Small Scale

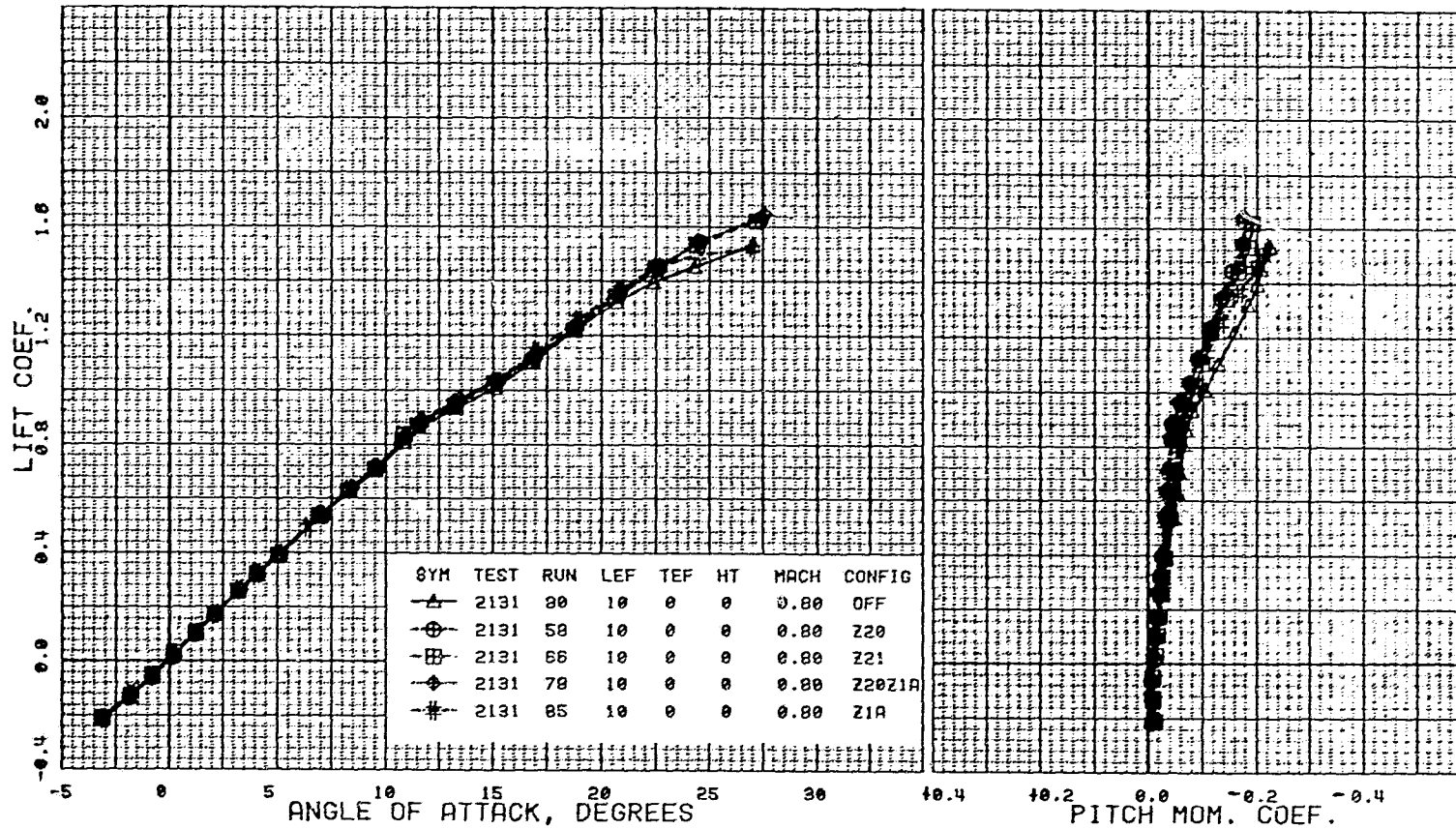


Figure 3-38 Effect of Forebody Chines (Z20,Z21) and Canard Strake Z1A, Configuration 401F-10A, LEF=10°, M = 0.80
(a) Lift and Pitching Moment

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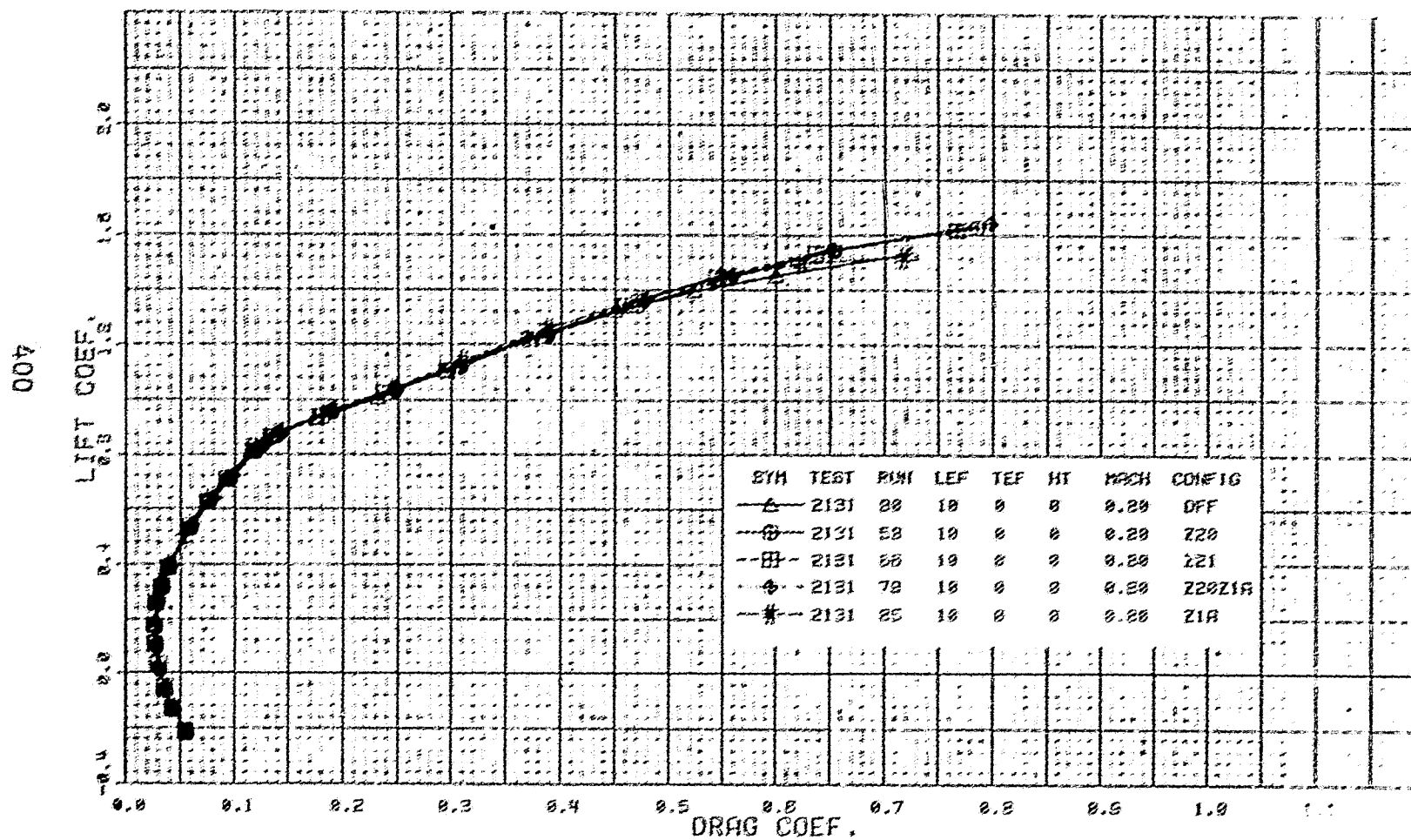


Figure 3-38 (b) Drag, Large Scale

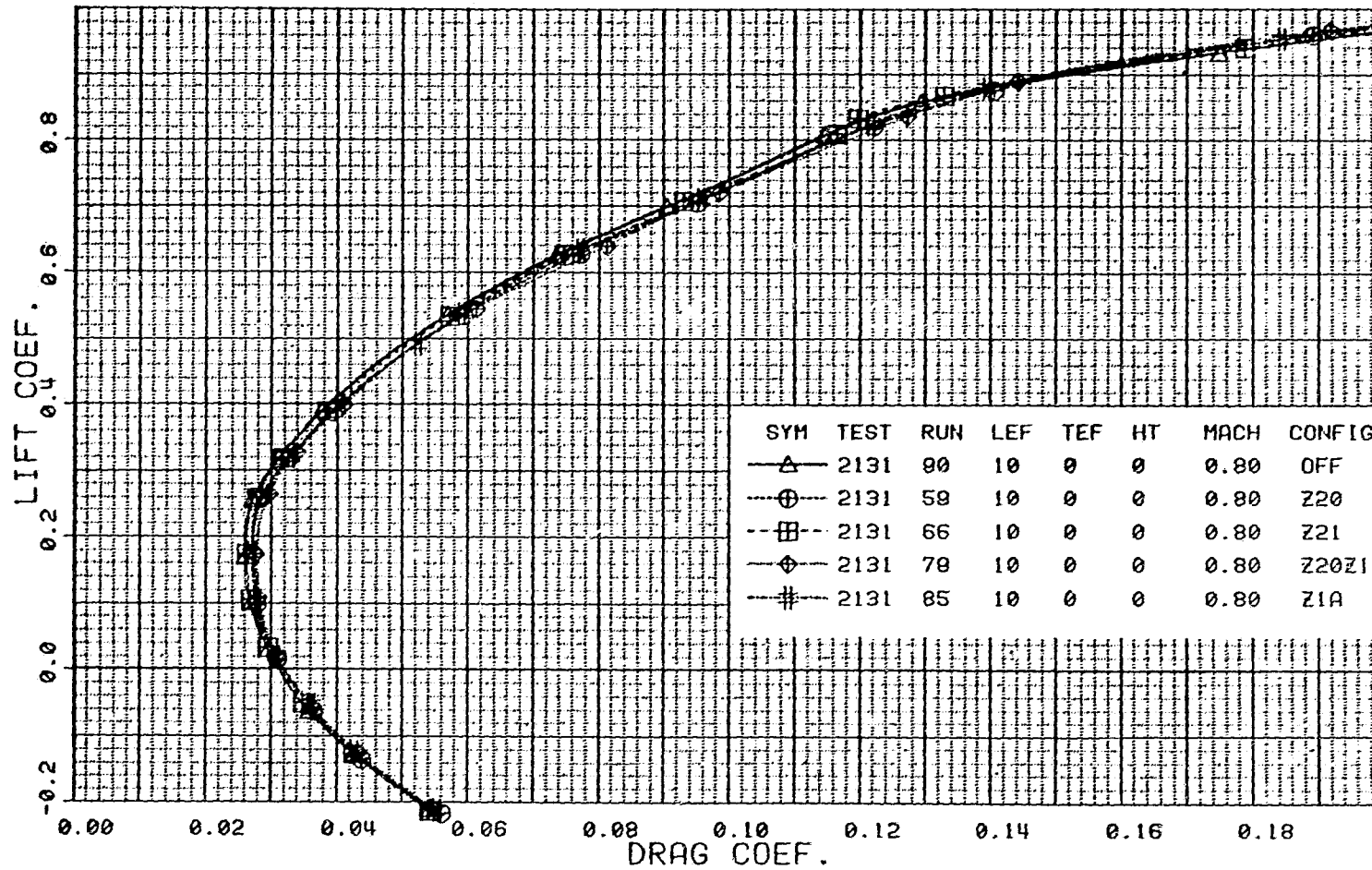


Figure 3-38 (c) Drag, Small Scale

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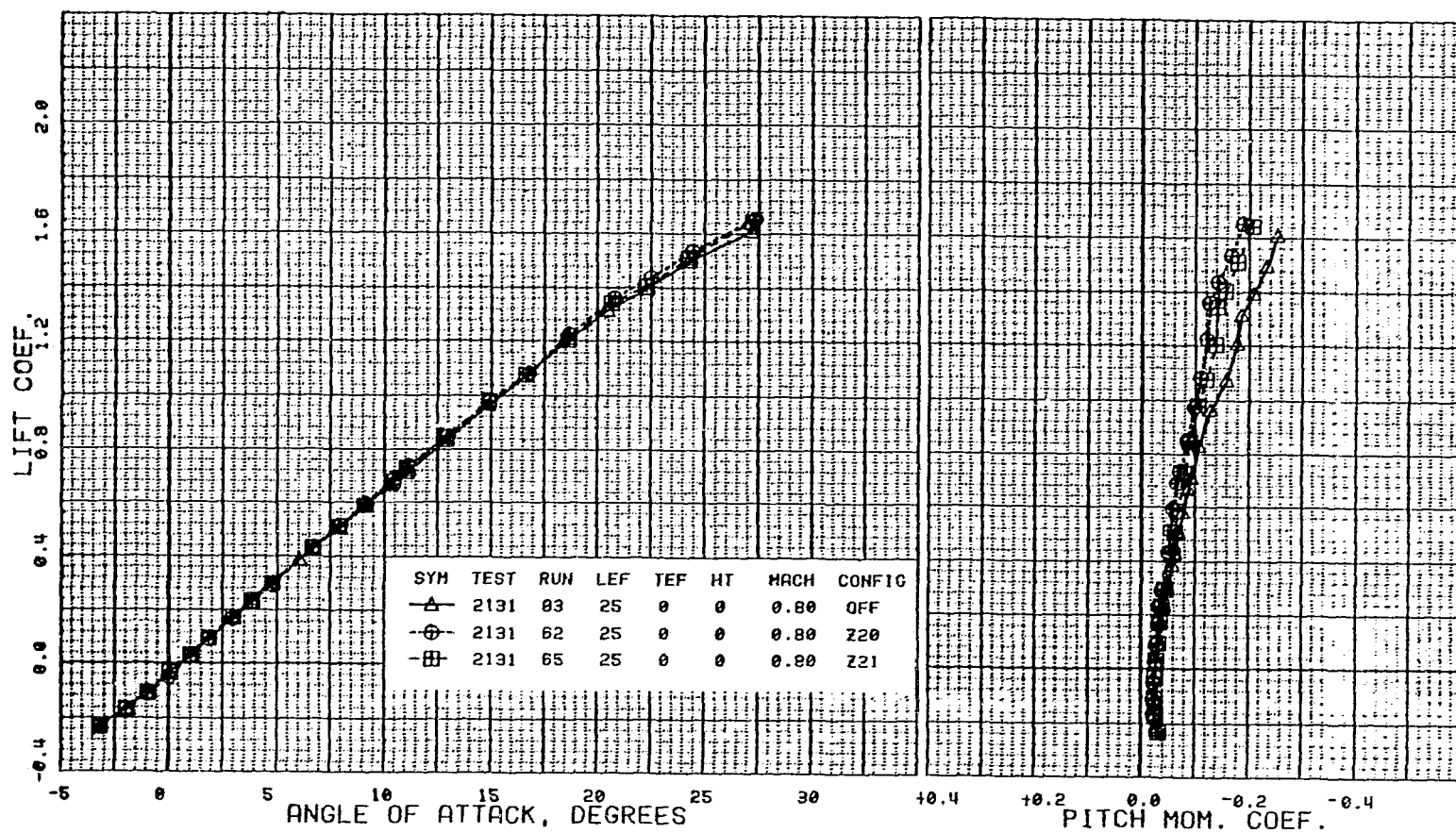


Figure 3-39 Effect of Forebody Chines (Z20,Z21), Configuration 401F-10A, LEF = 25°, M = 0.80
(a) Lift and Pitching Moment

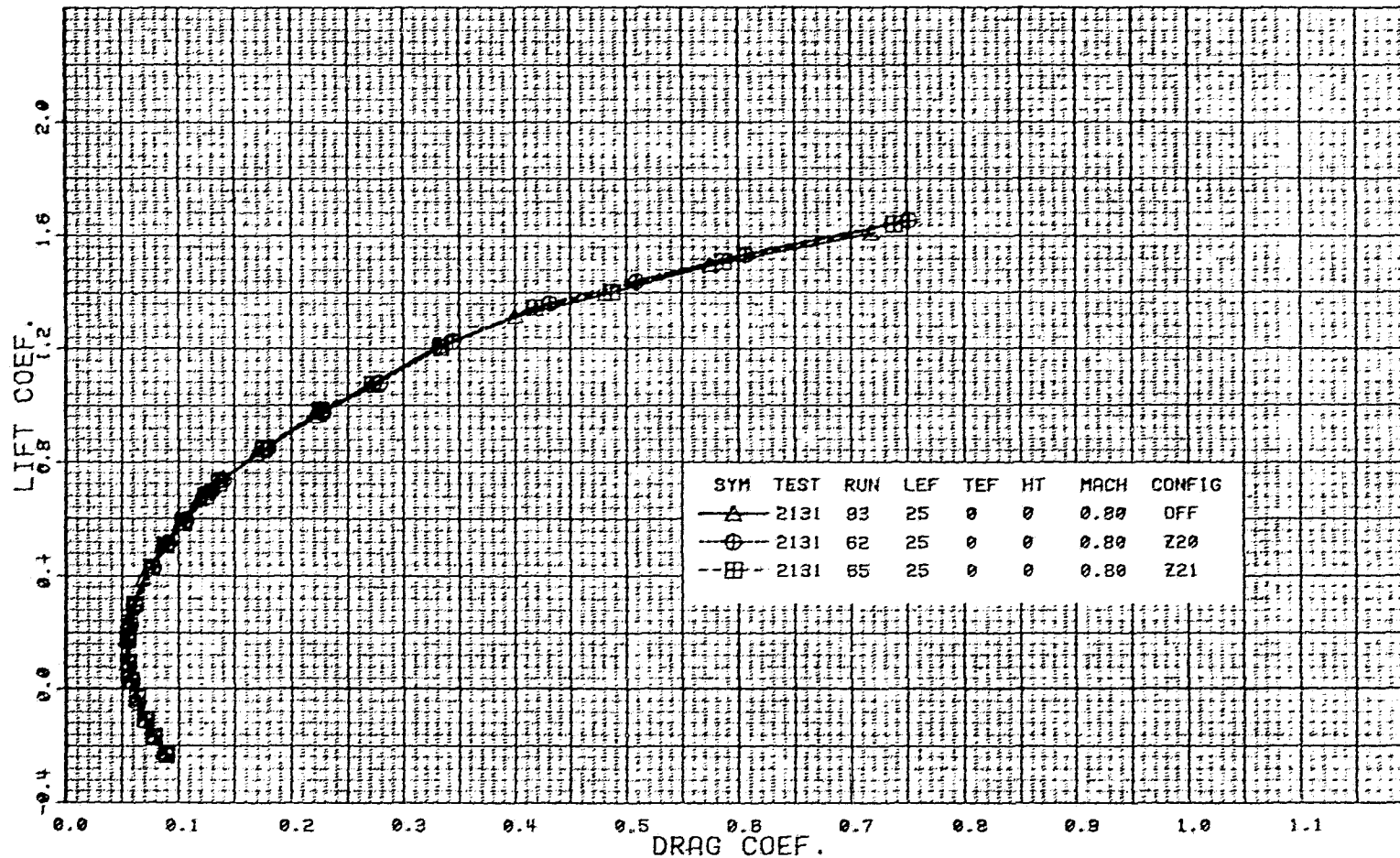


Figure 3-39 (b) Drag, Large Scale

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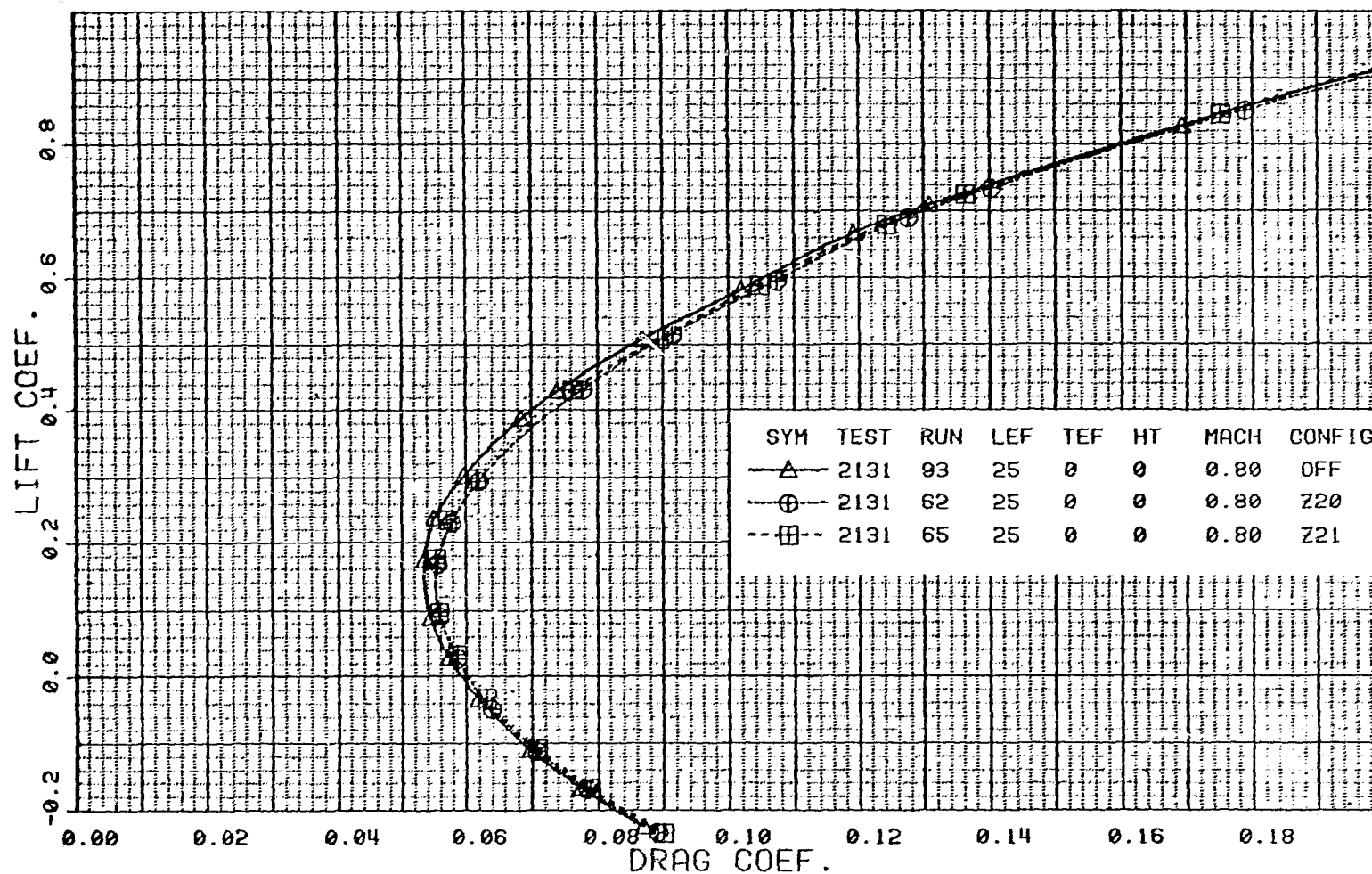


Figure 3-39 (c) Drag, Small Scale

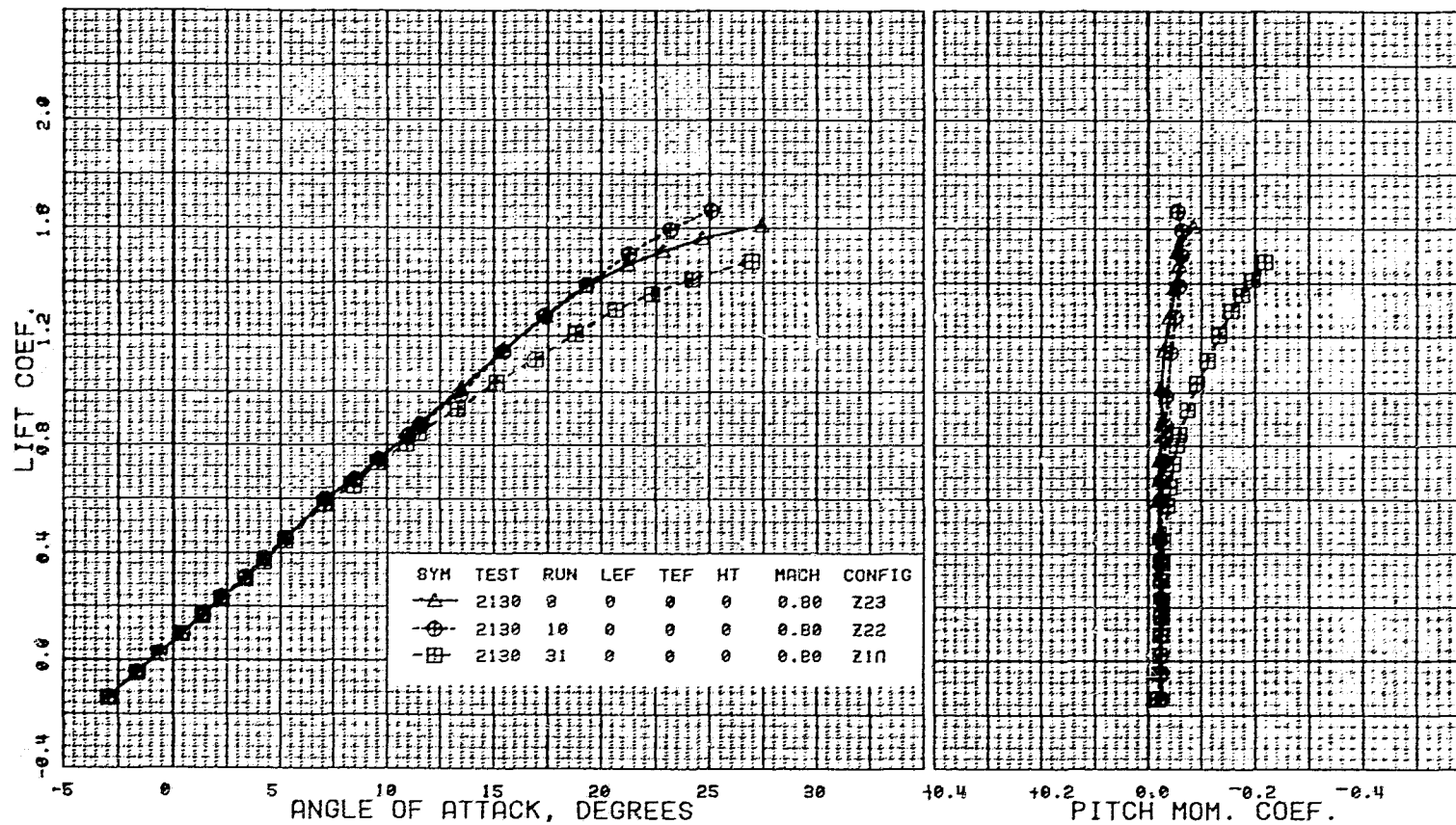


Figure 3-40 Comparison of Forebody Strake Z22 with Canard Strake Z1A,
Configuration 401F-5, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

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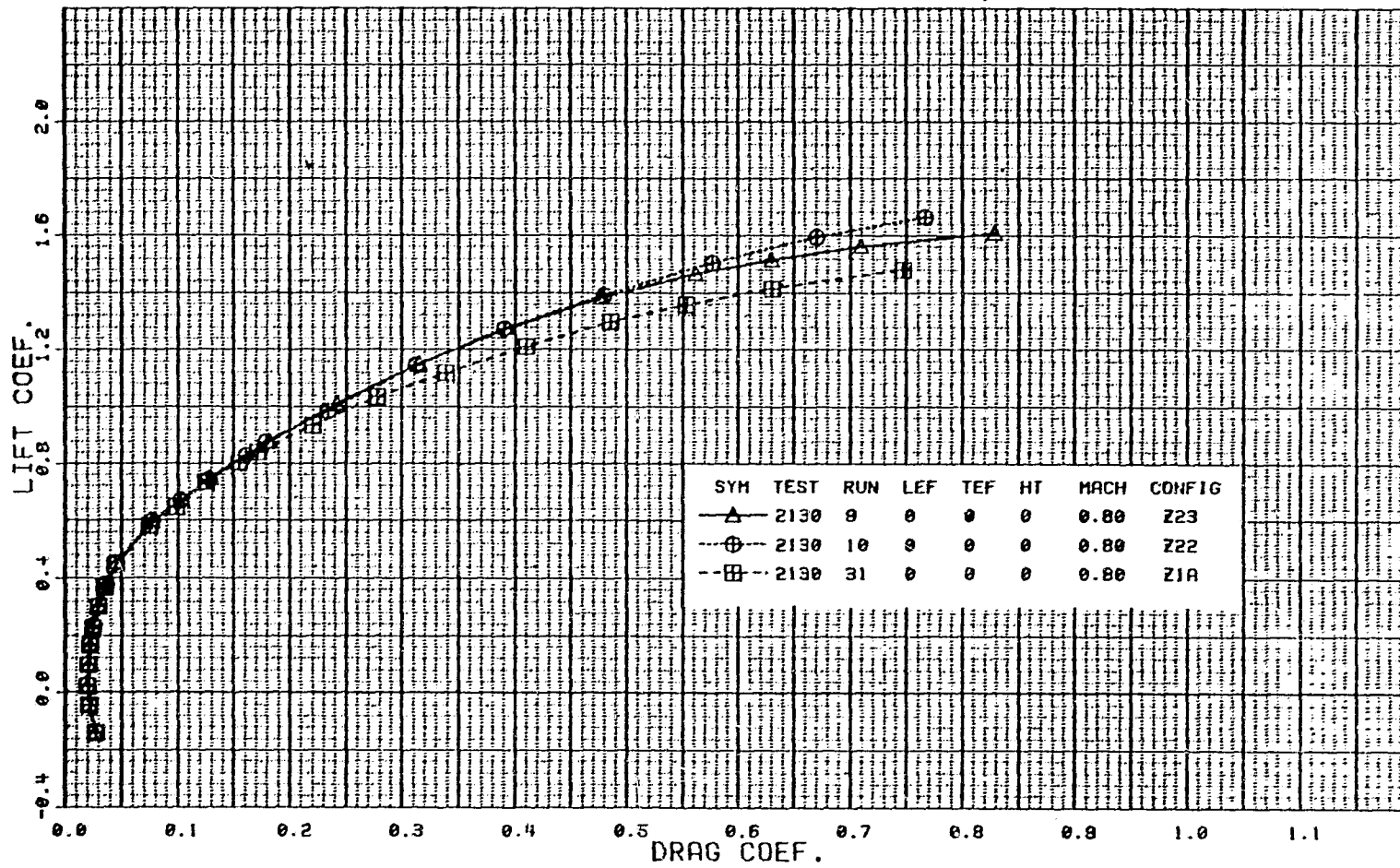


Figure 3-40 (b) Drag, Large Scale

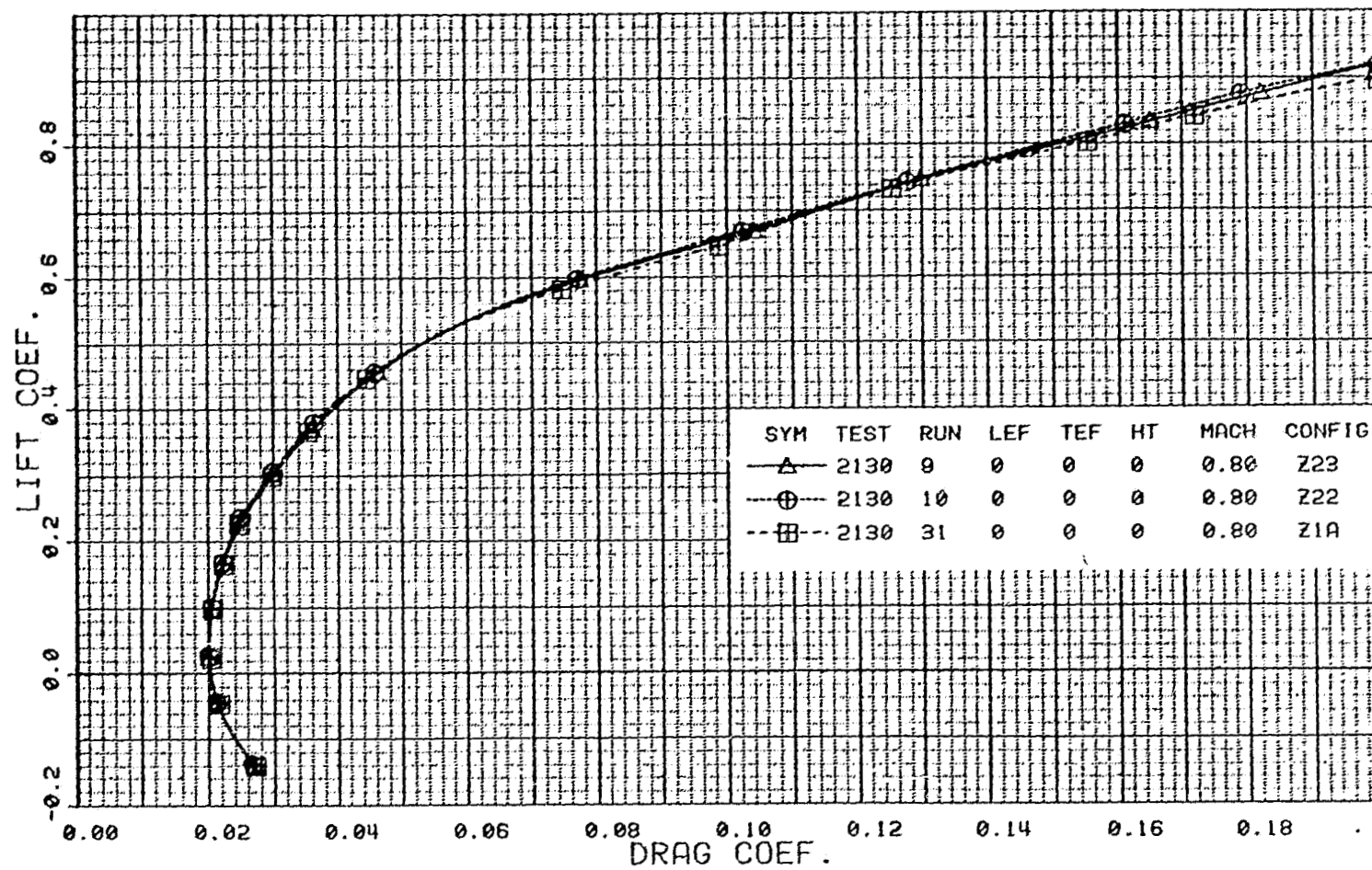


Figure 3-40 (c) Drag, Small Scale

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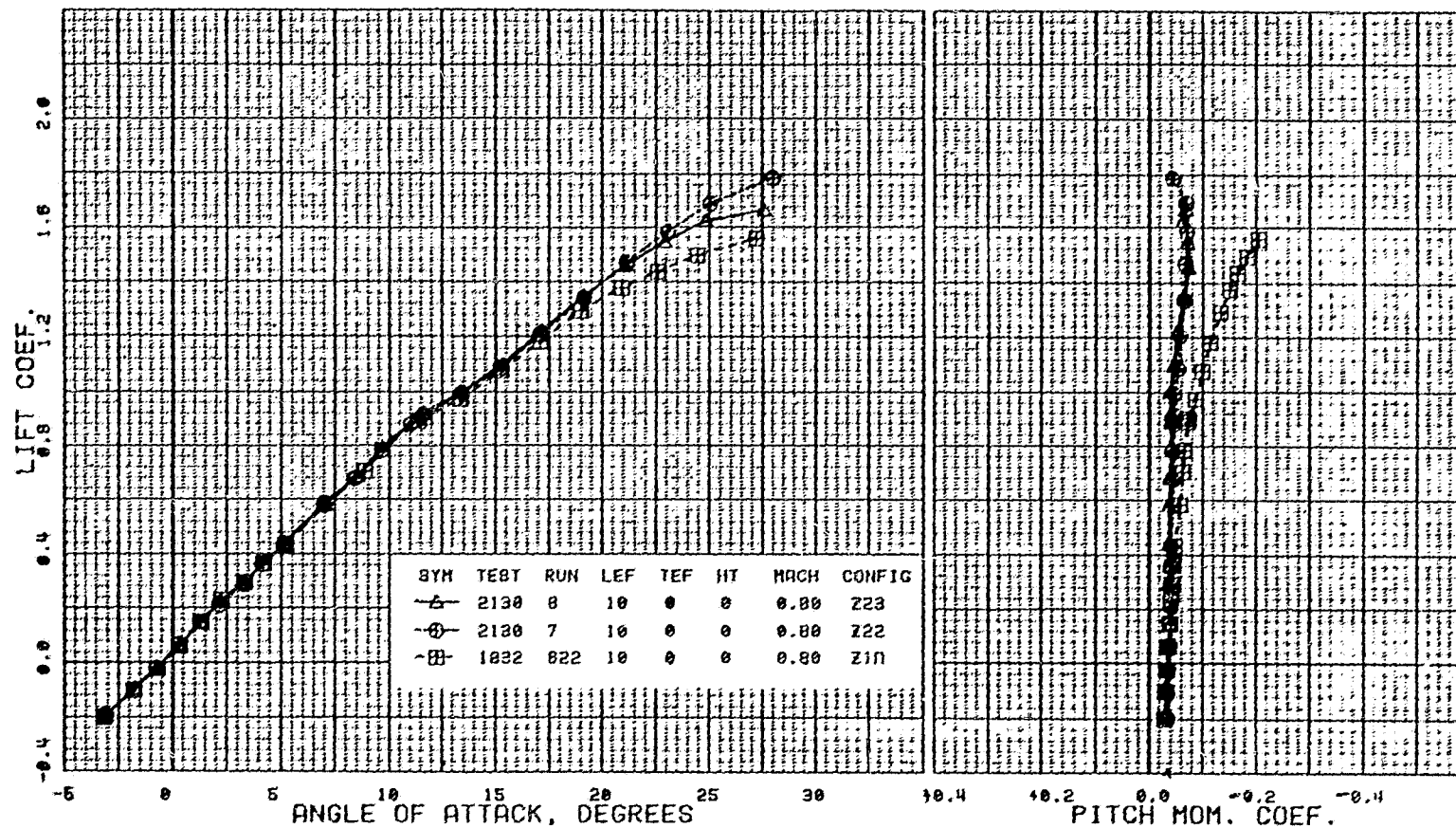


Figure 3-41 Comparison of Forebody Strakes Z22 and Z23 with Canard Strake Z1A, Configuration 401F-5, LEF = 10, M = 0.80
(a) Lift and Pitching Moment

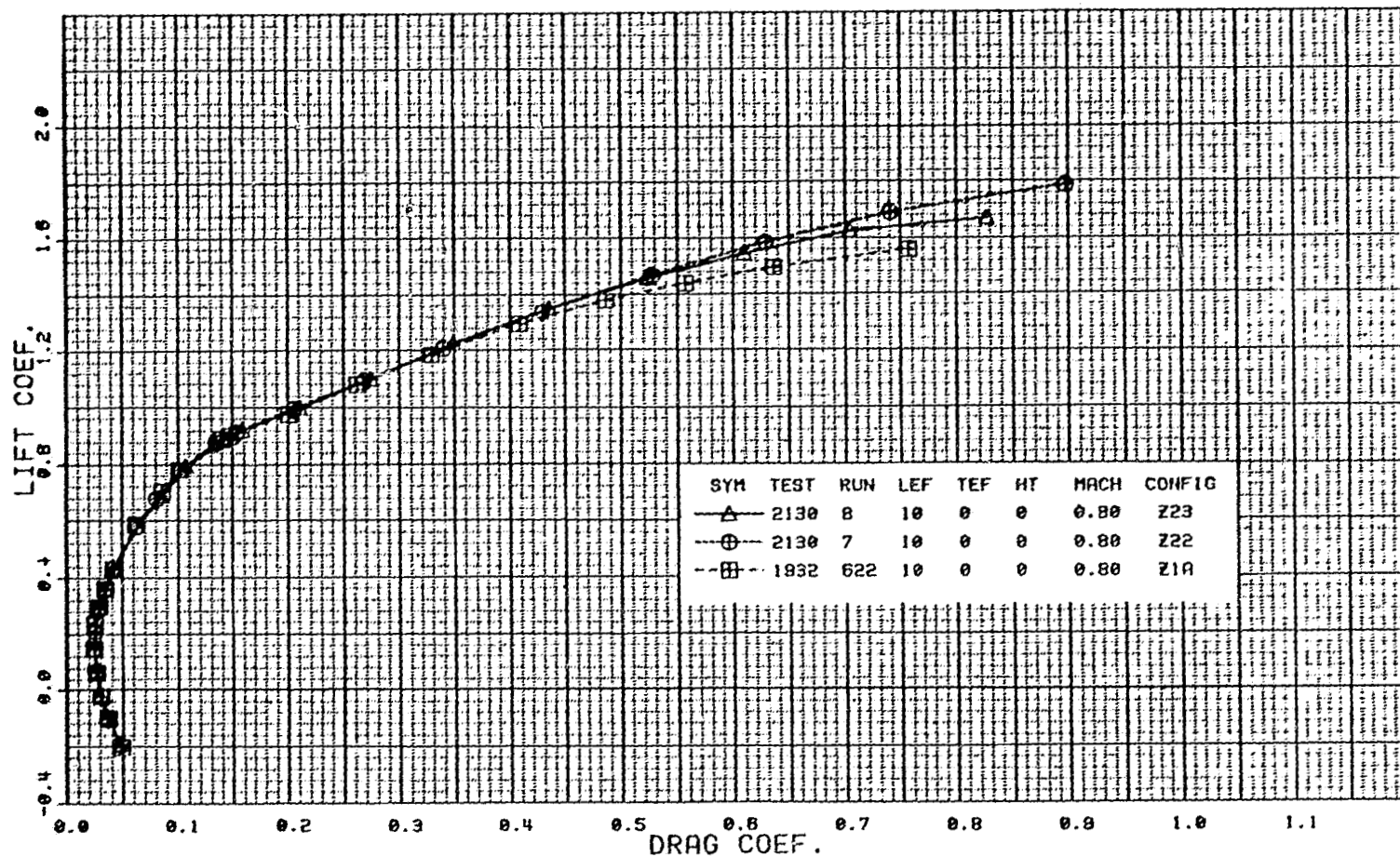


Figure 3-41 (b) Drag, Large Scale

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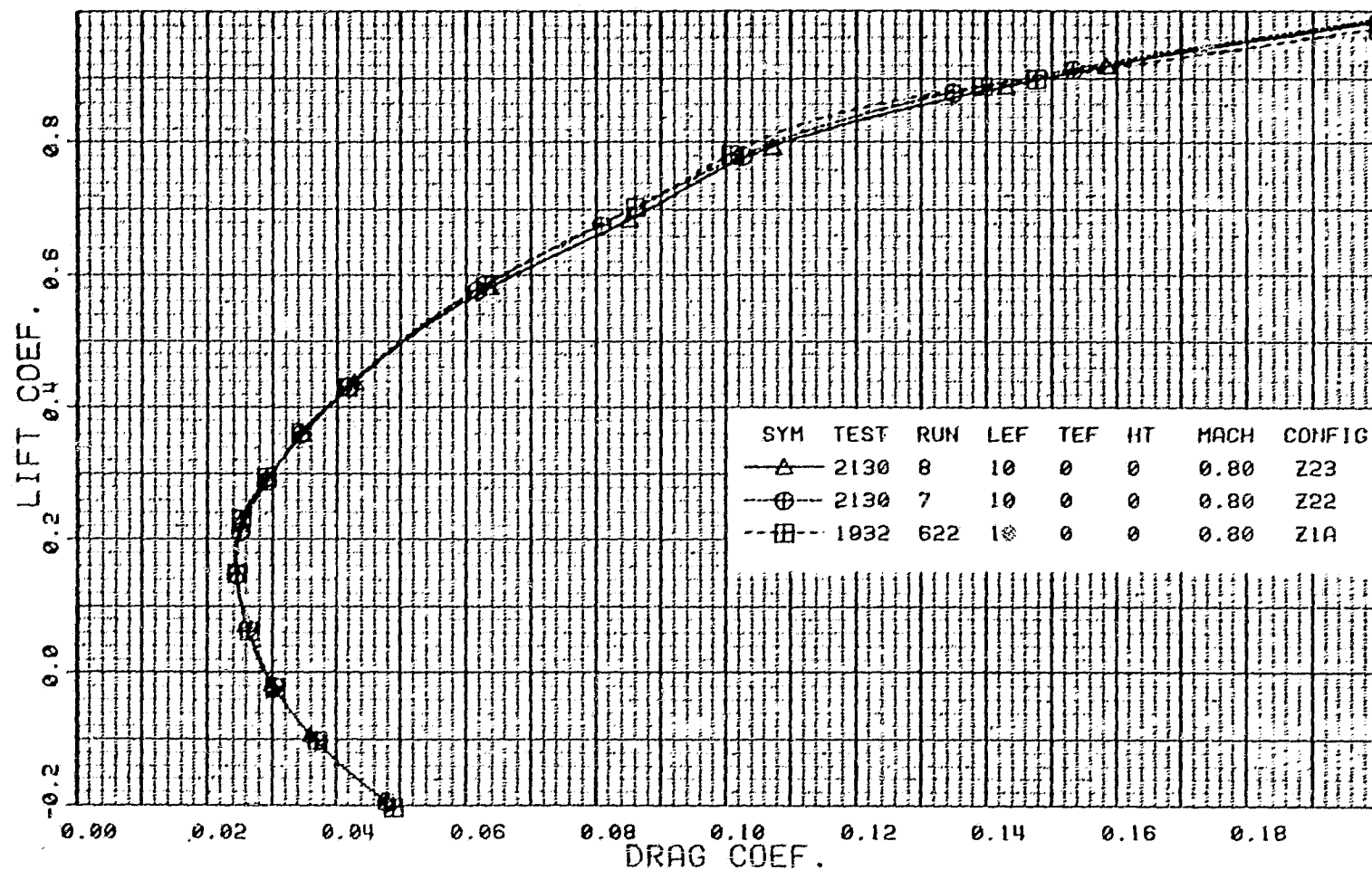


Figure 3-41 (c) Drag, Small Scale

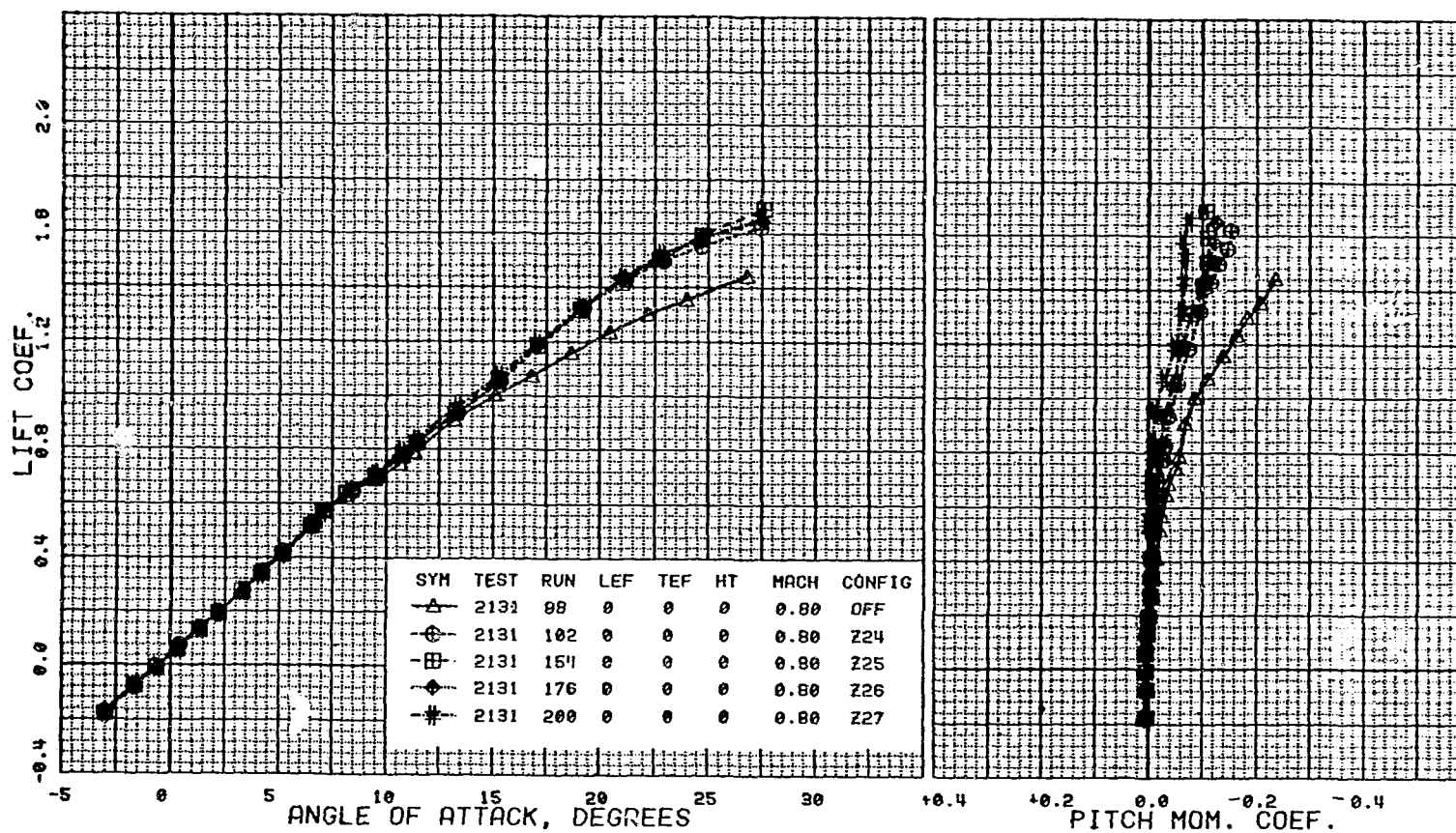


Figure 3-42 Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

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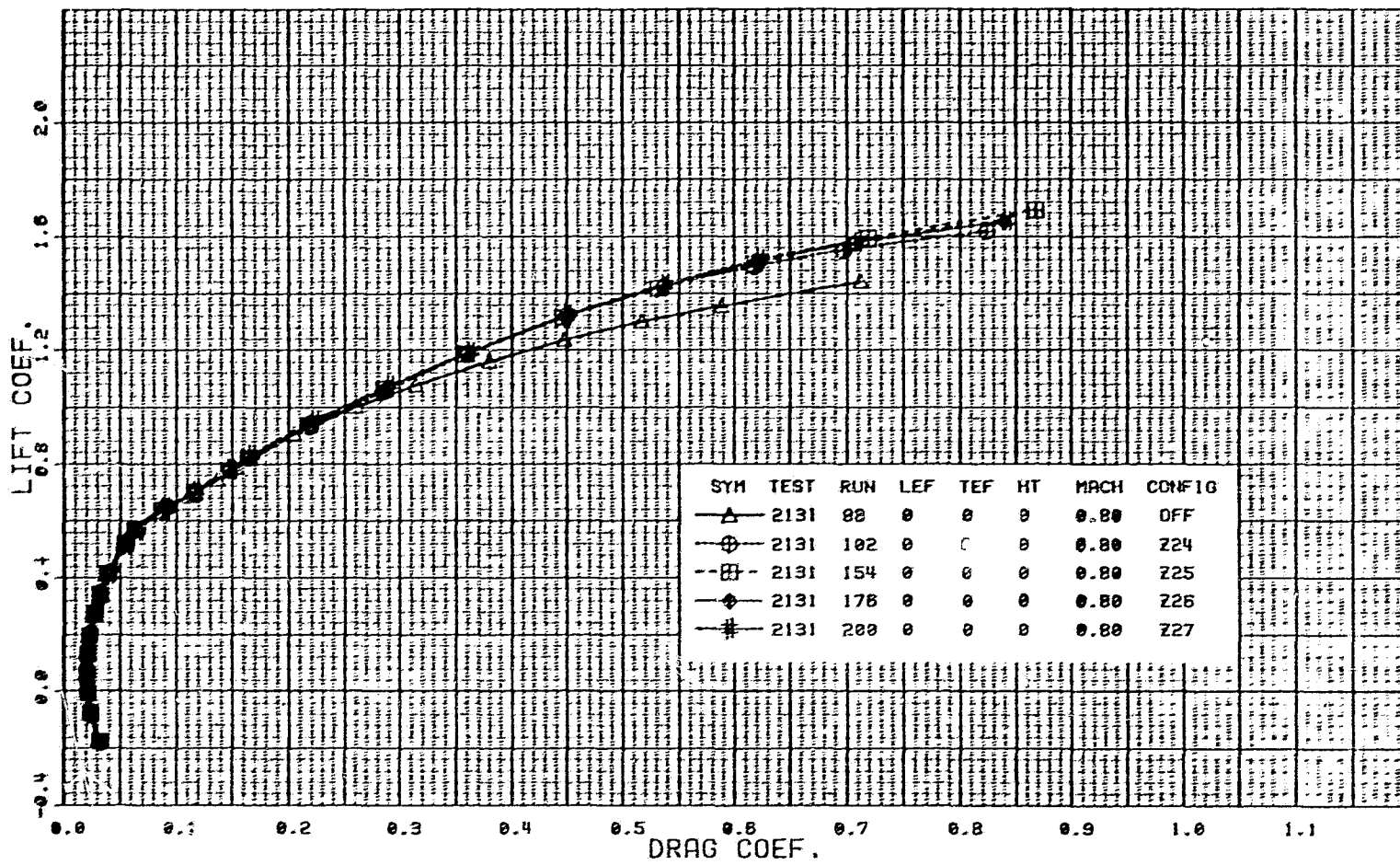


Figure 3-42 (b) Drag, Large Scale

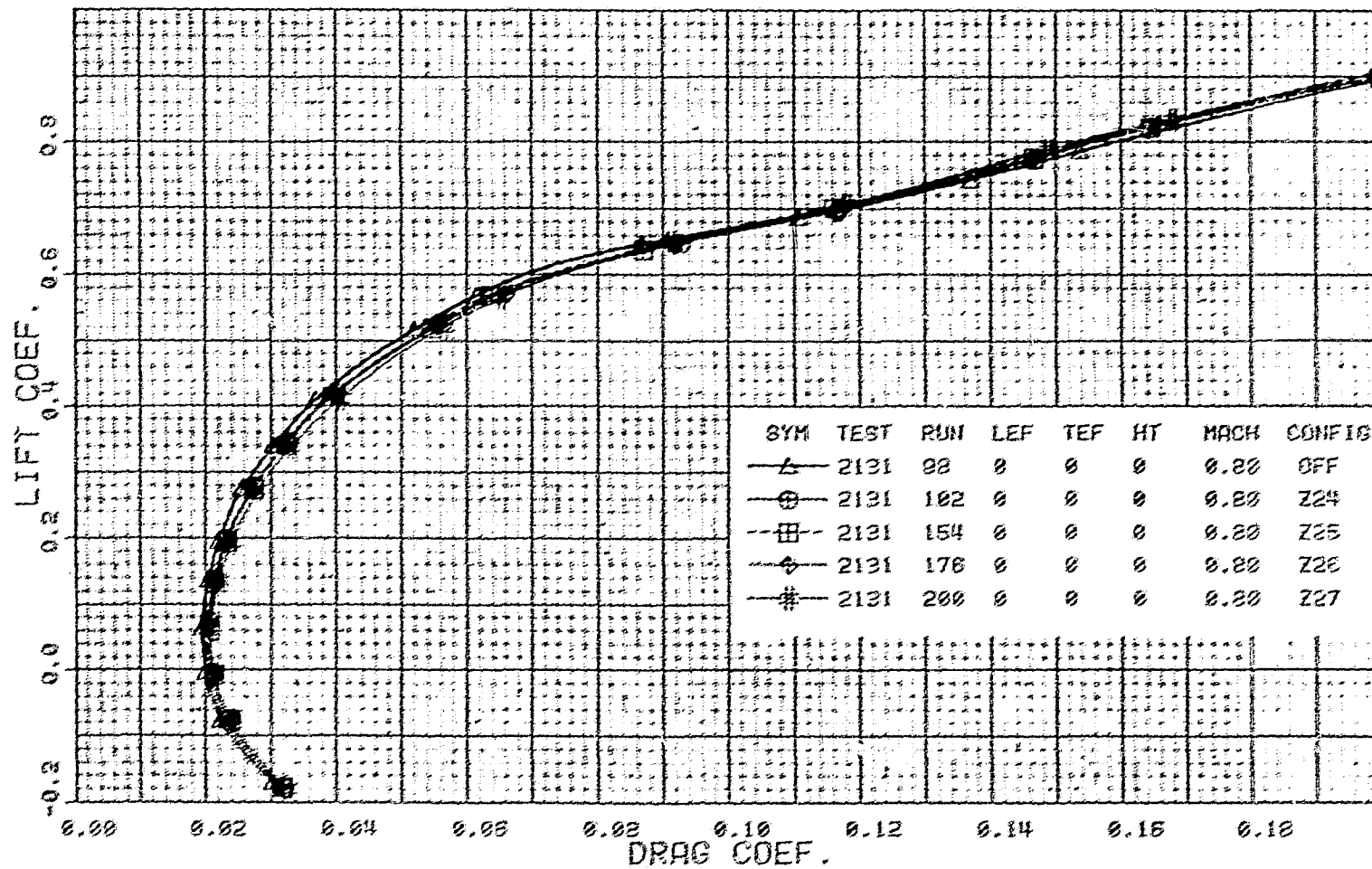


Figure 3-42 (c) Drag, Small Scale

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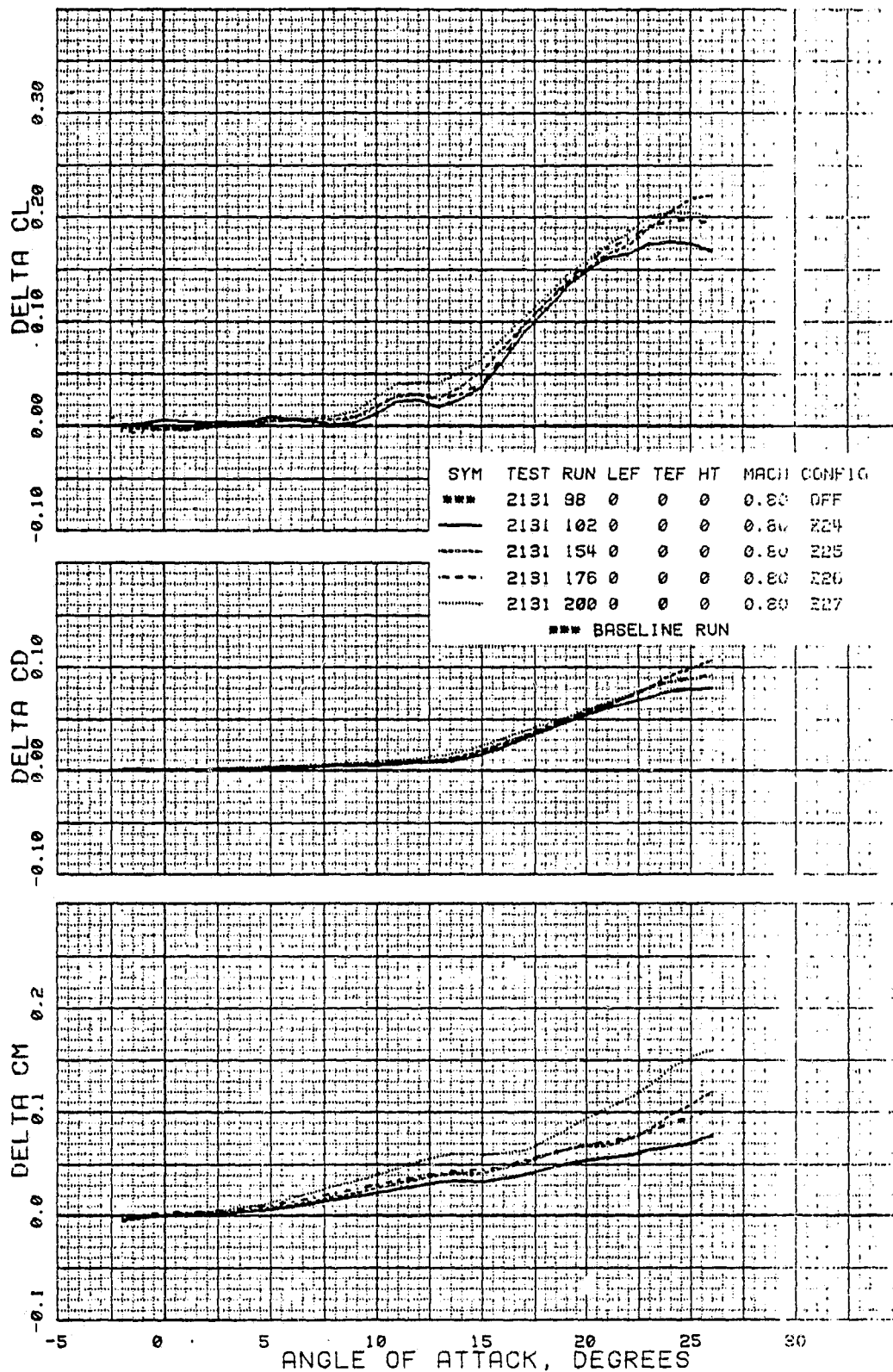


Figure 3-42 (d) Increments

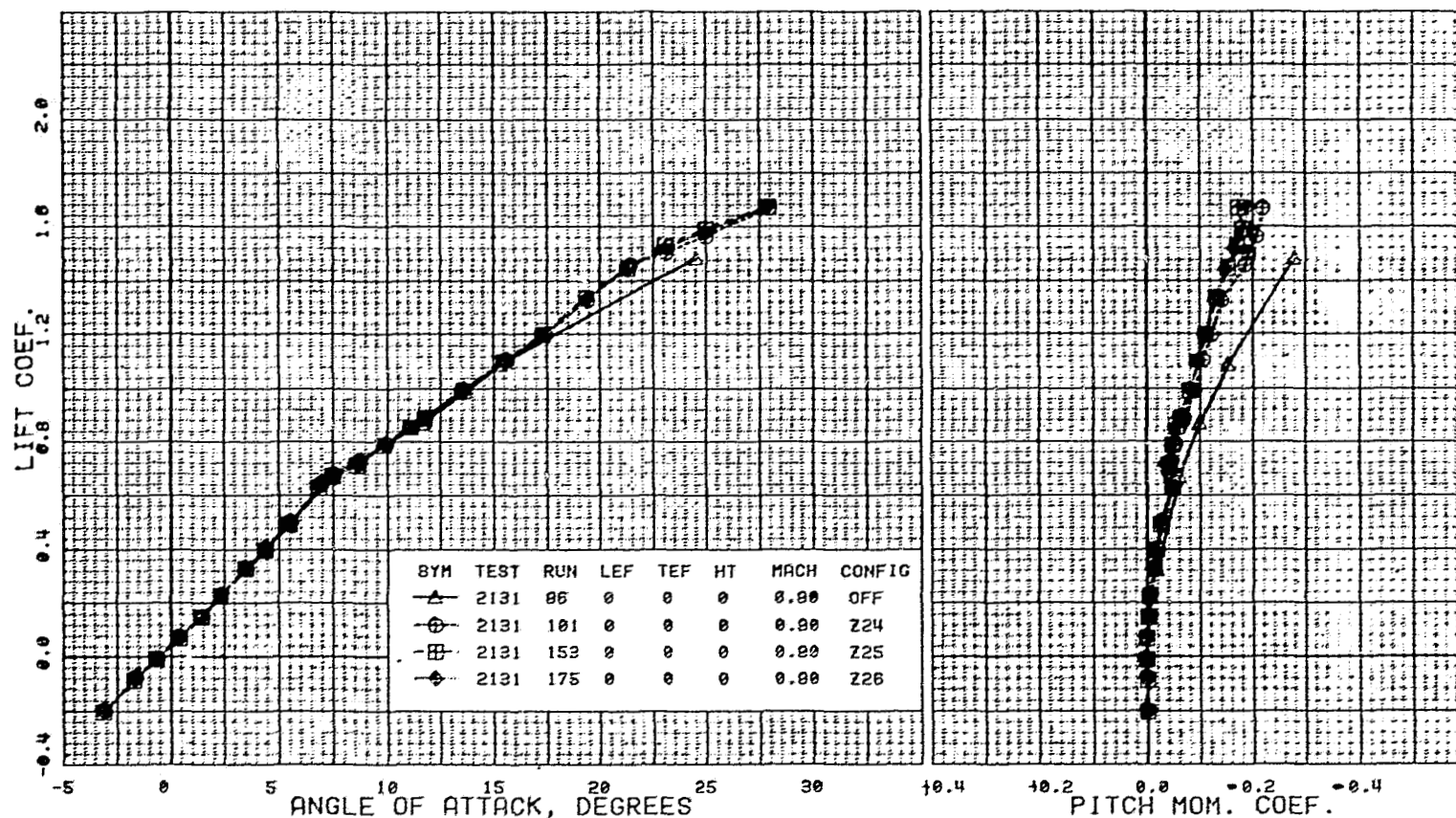


Figure 3-43 Effect of Forebody Strake Shape (Z24-Z26), Configuration 401F-10A, $LEF = 0$, $M = 0.90$
(a) Lift and Pitching Moment

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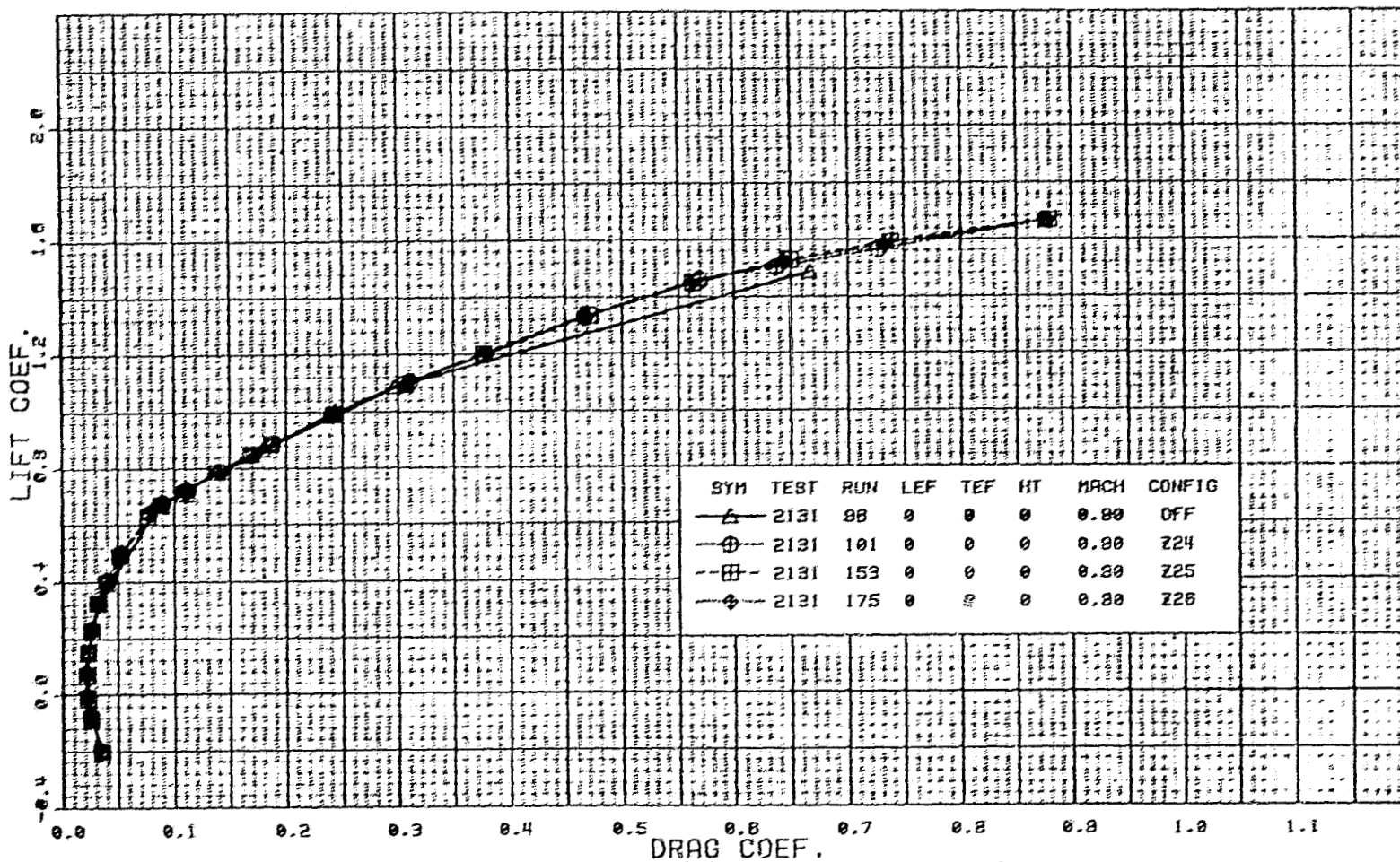


Figure 3-43 (b) Drag, Large Scale

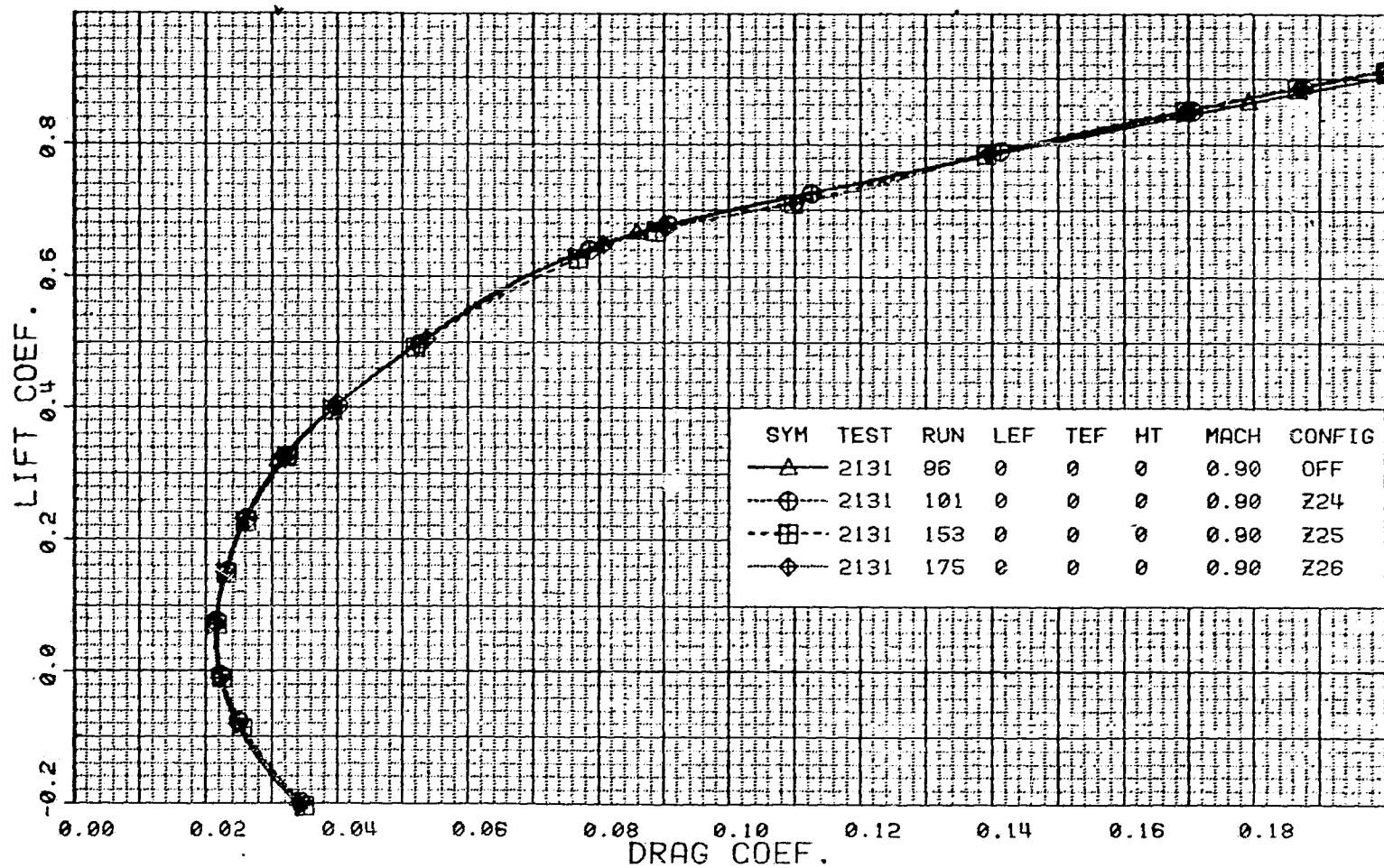


Figure 3-43 (c) Drag, Small Scale

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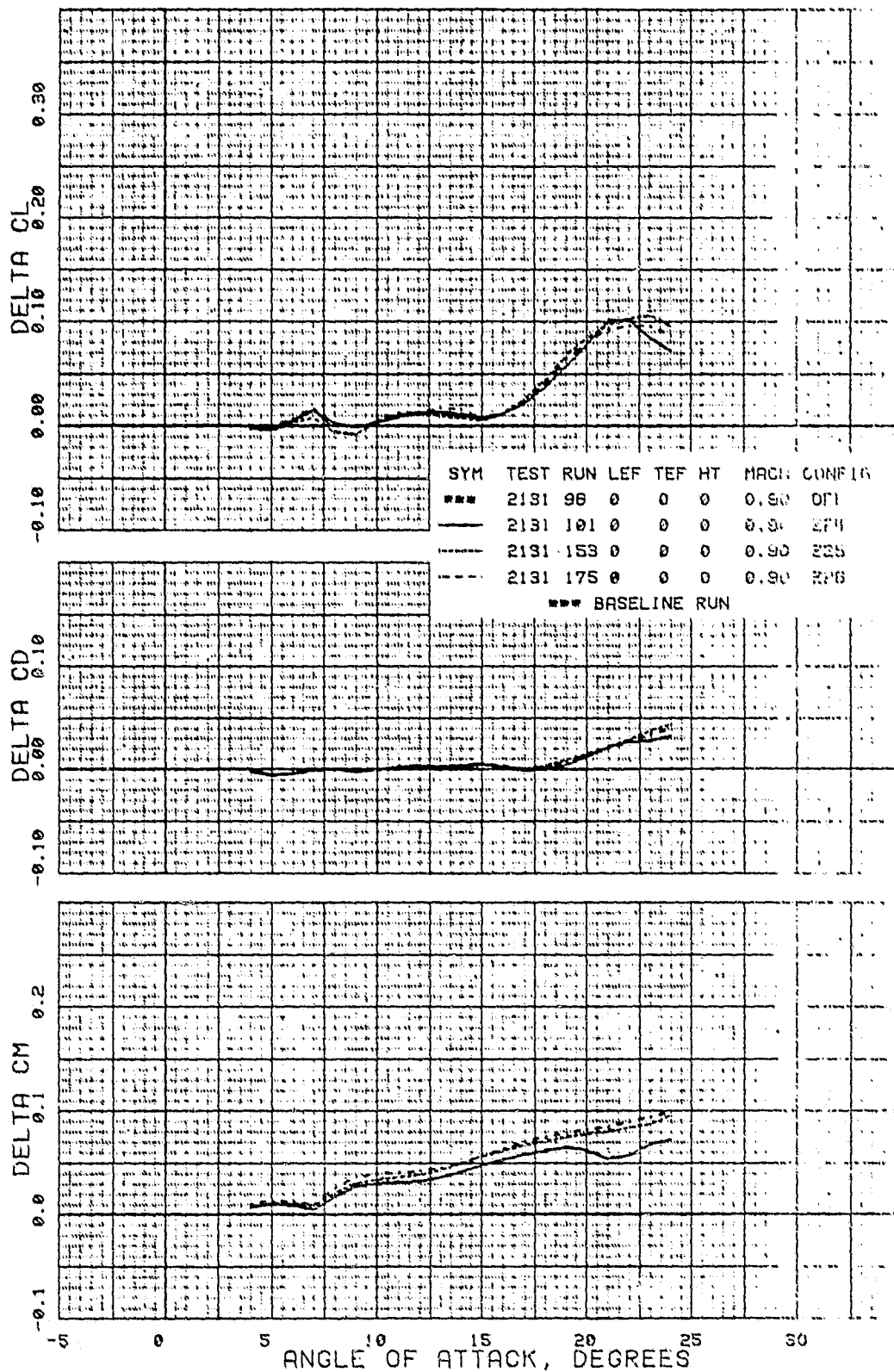


Figure 3-43 (d) Increments

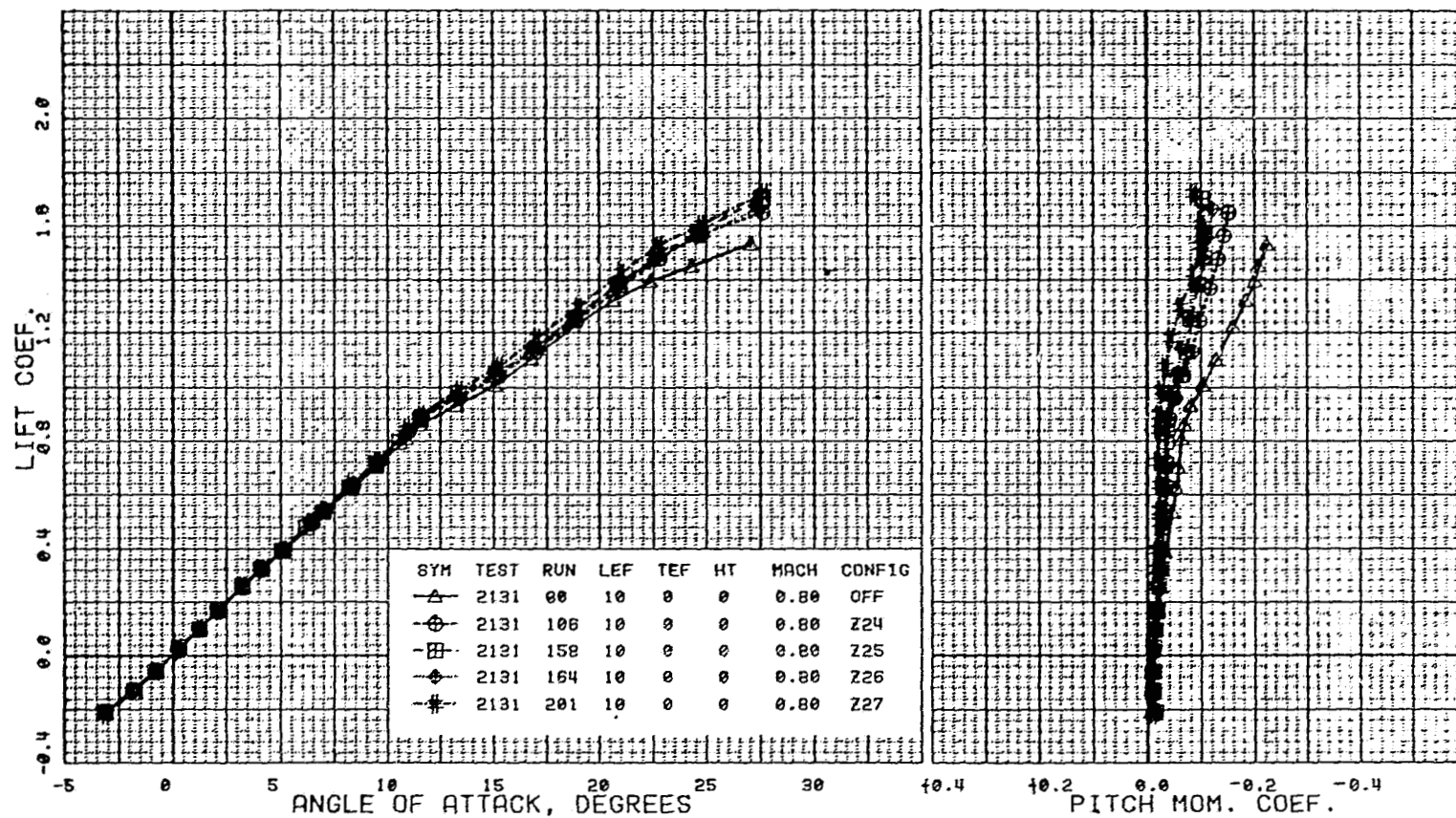


Figure 3-44 Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 10°, M = 0.80
(a) Lift and Pitching Moment

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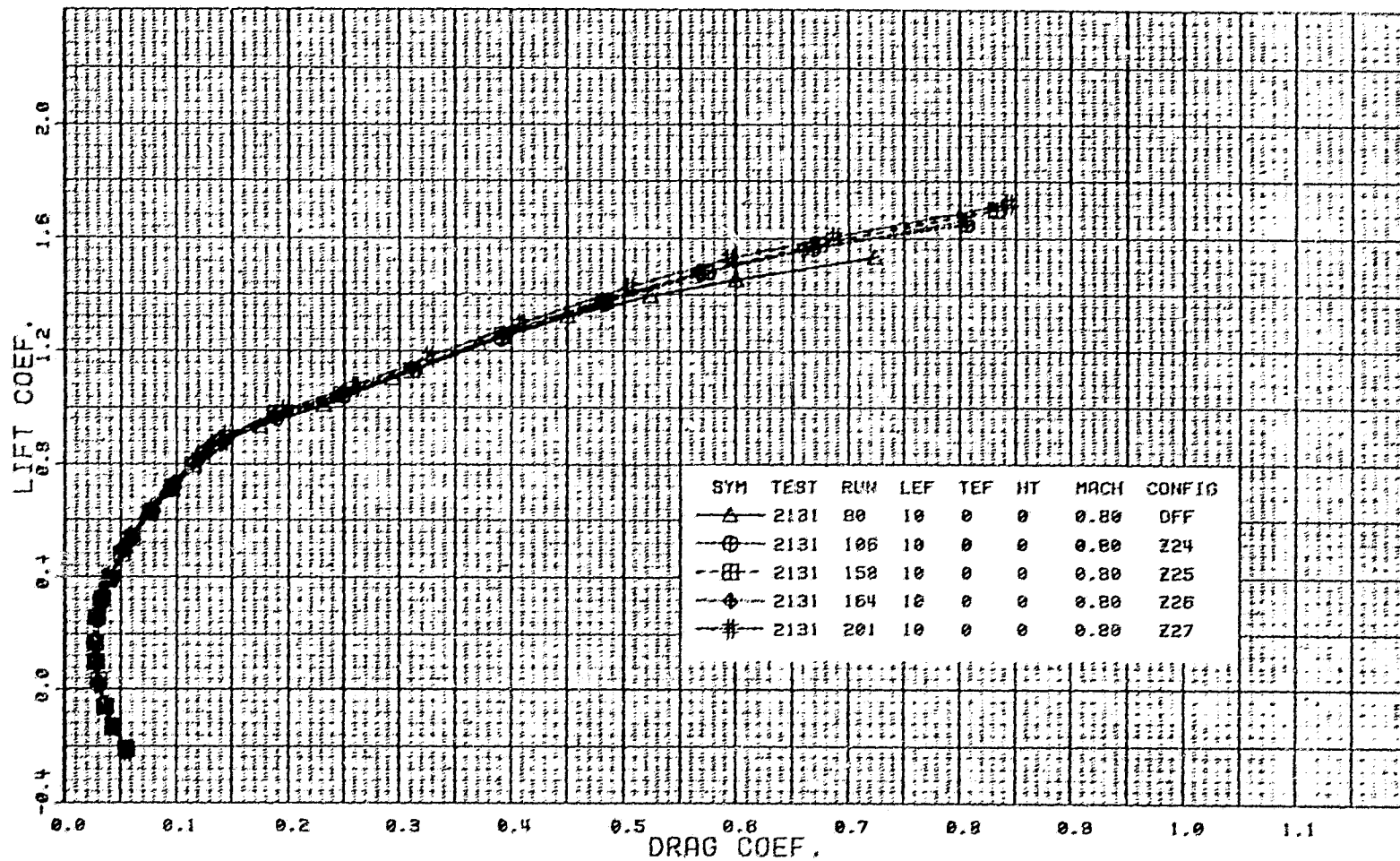


Figure 3-44 (b) Drag, Large Scale

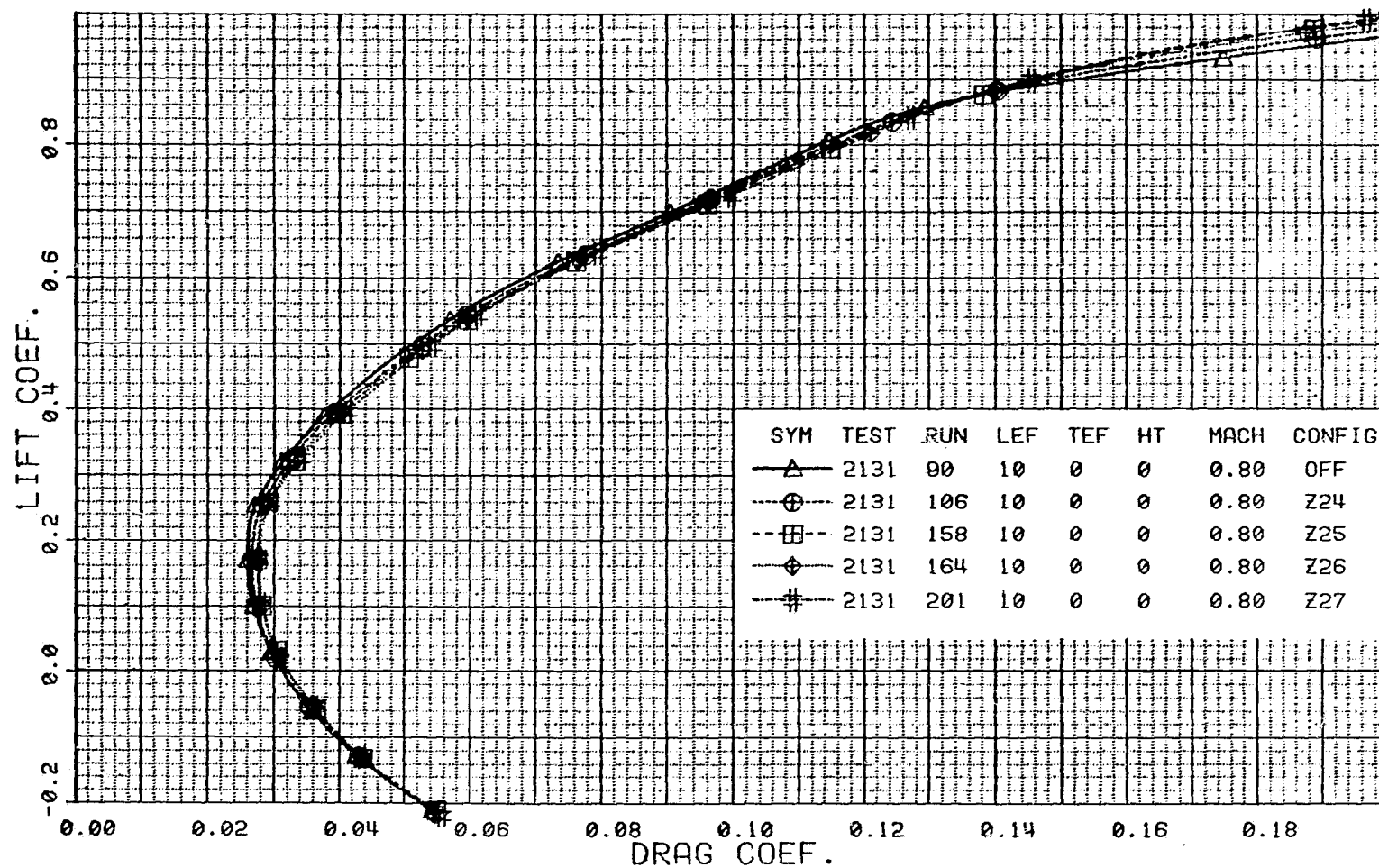


Figure 3-44 (c) Drag, Small Scale

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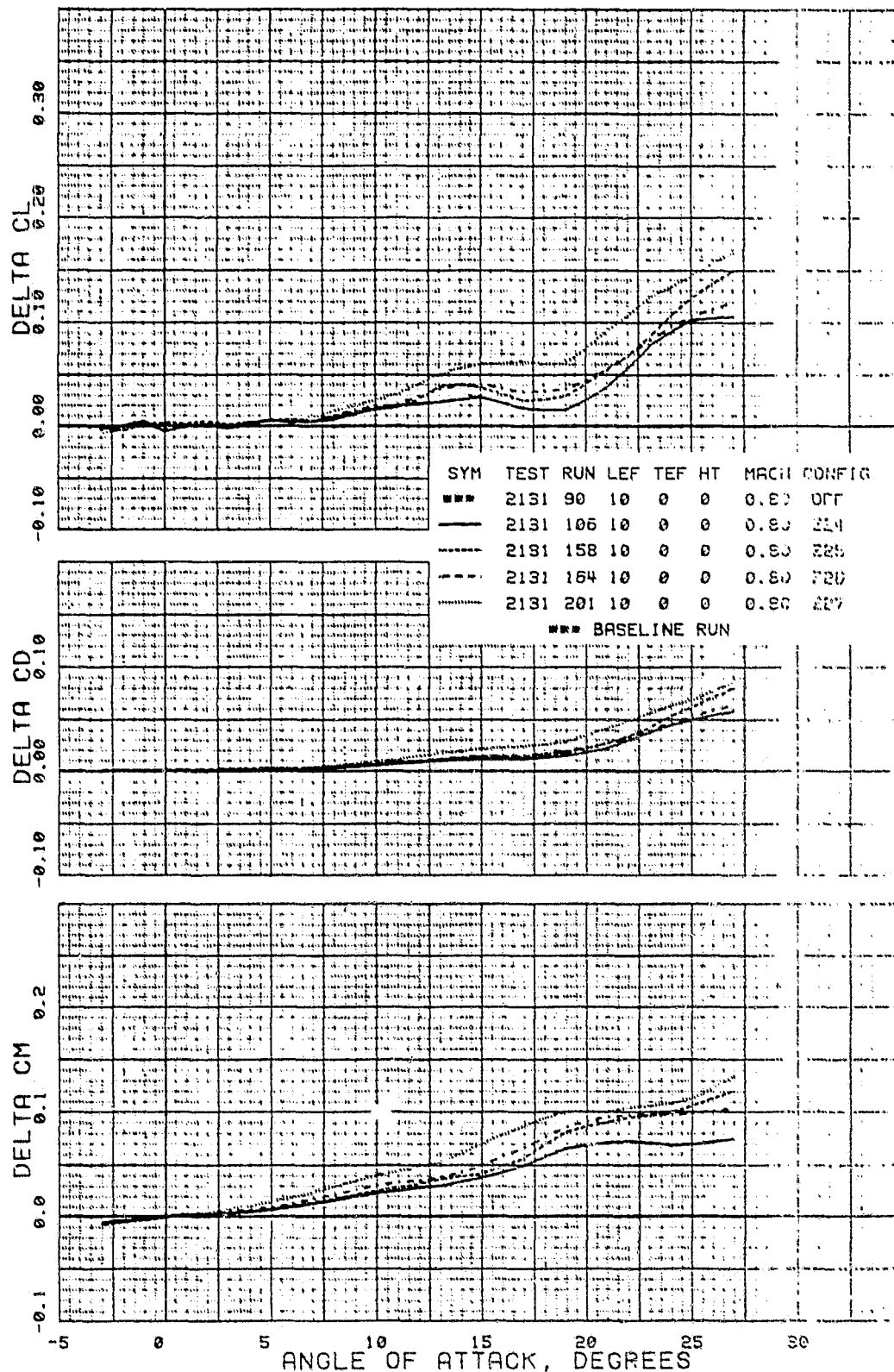


Figure 3-44 (d) Increments

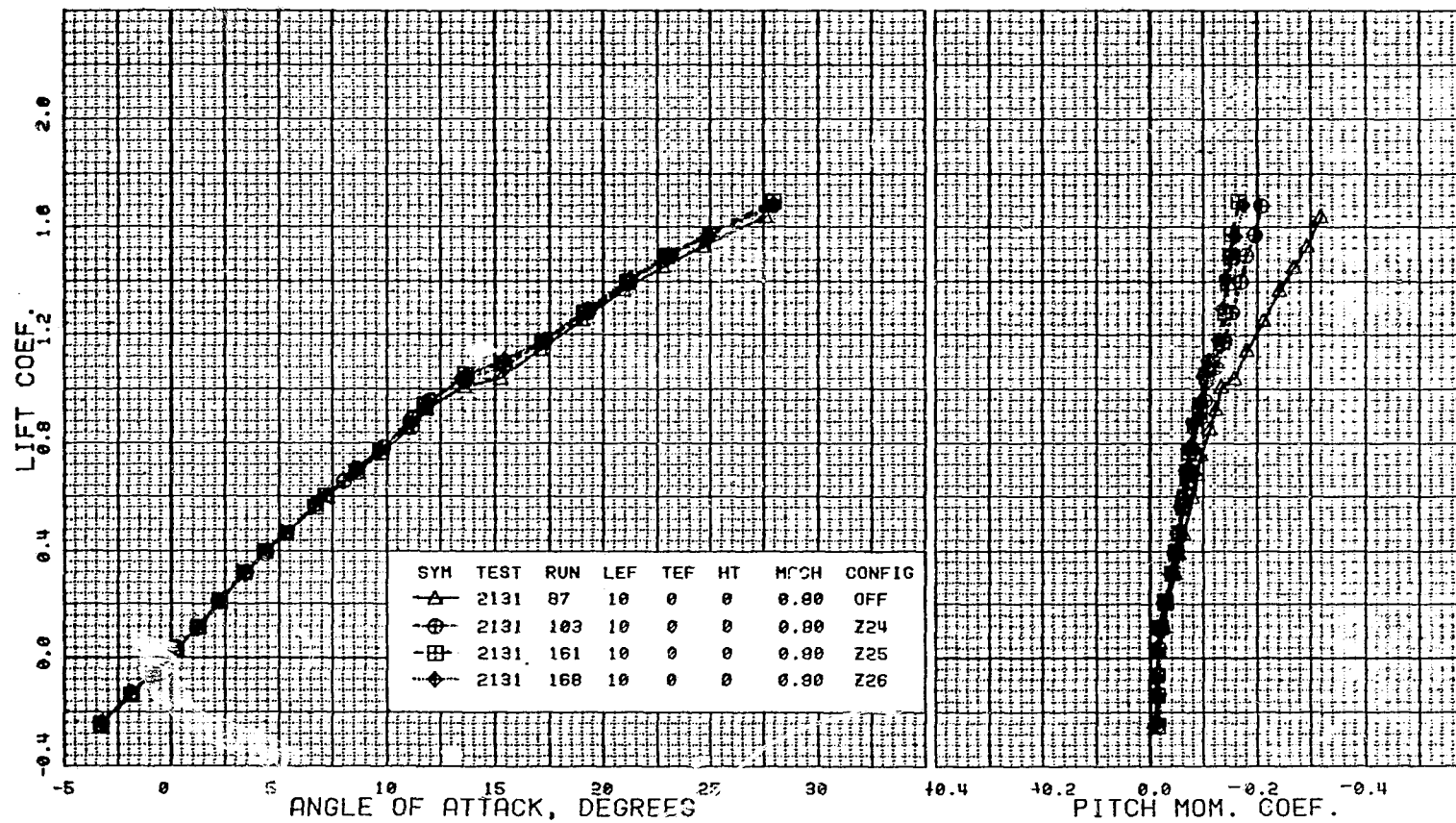


Figure 3-45 Effect of Forebody Strake Shape (Z24-Z26), Configuration 401F-10A, LEF = 10°, M = 0.90
(a) Lift and Pitching Moment

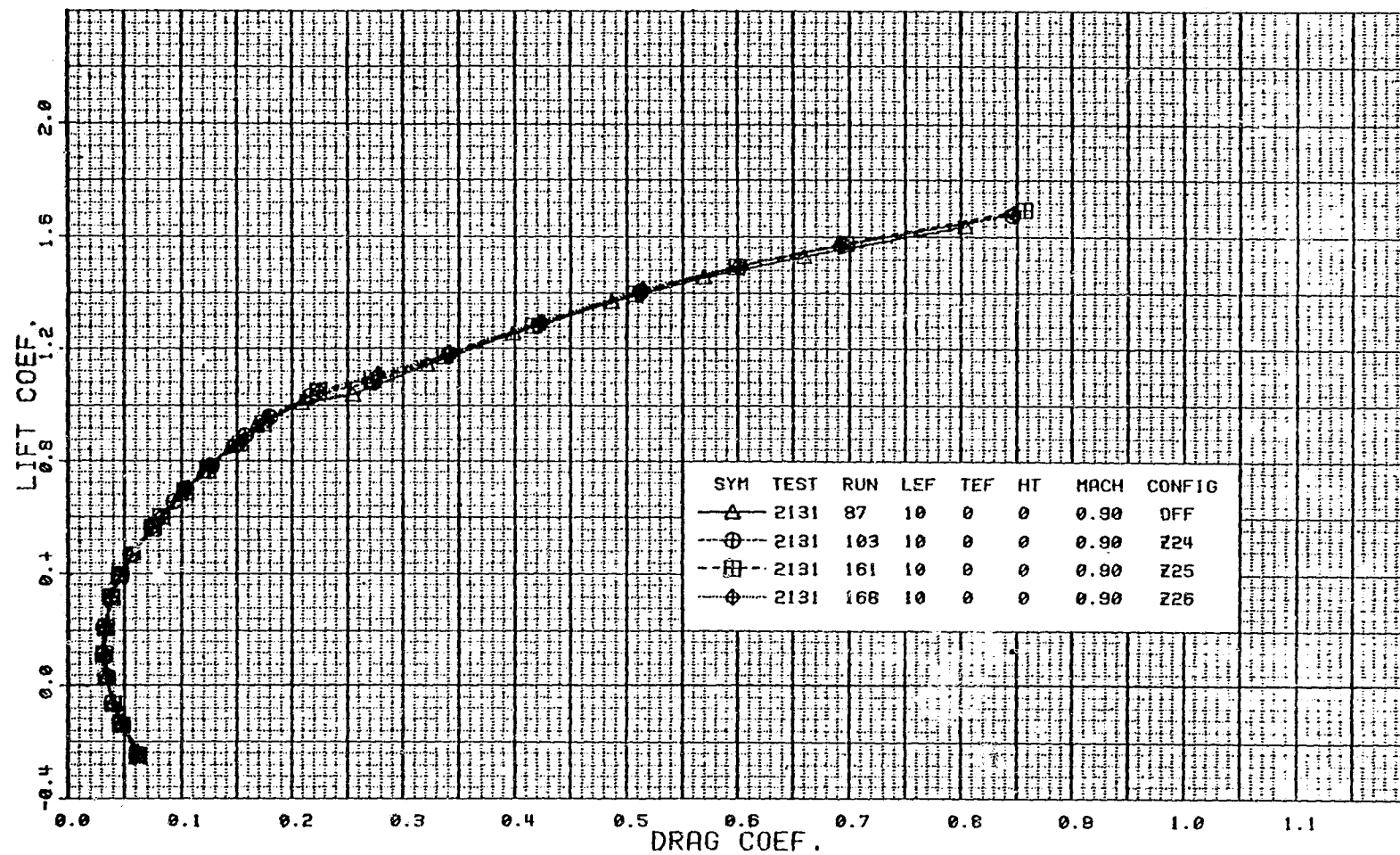


Figure 3-45 (b) Drag, Large Scale

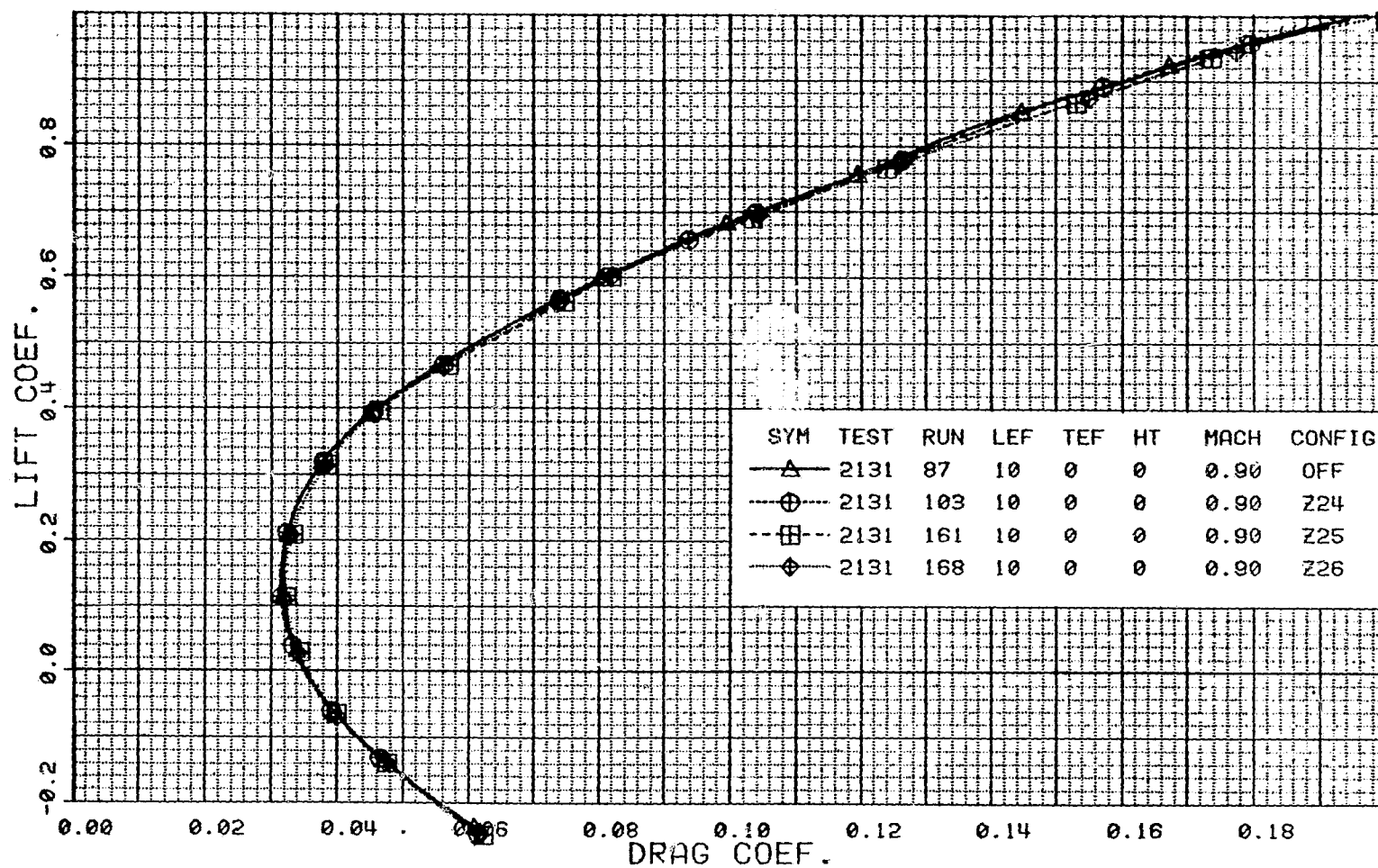


Figure 3-45 (c) Drag, Small Scale

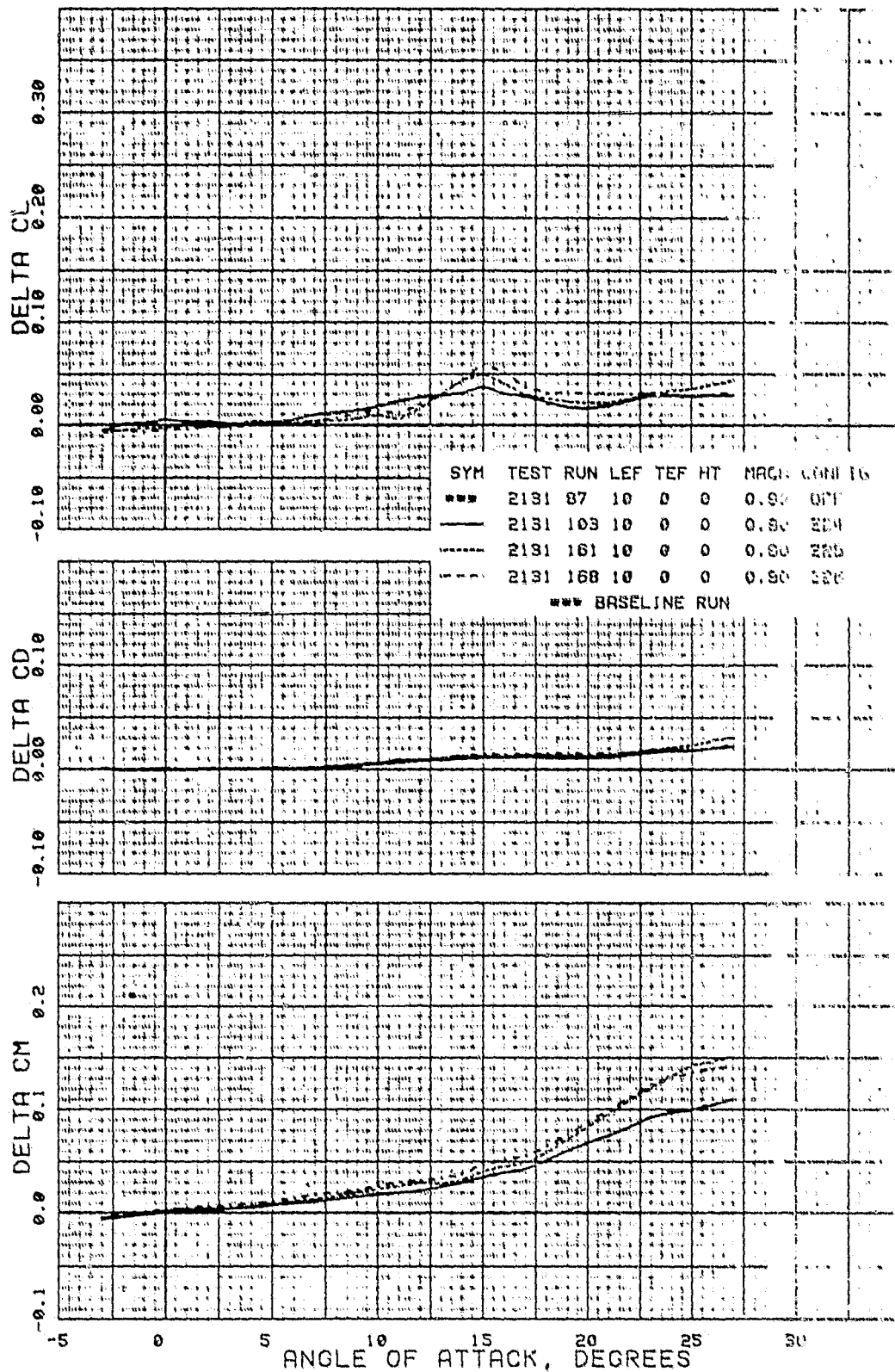


Figure 3-45 (d) Increments

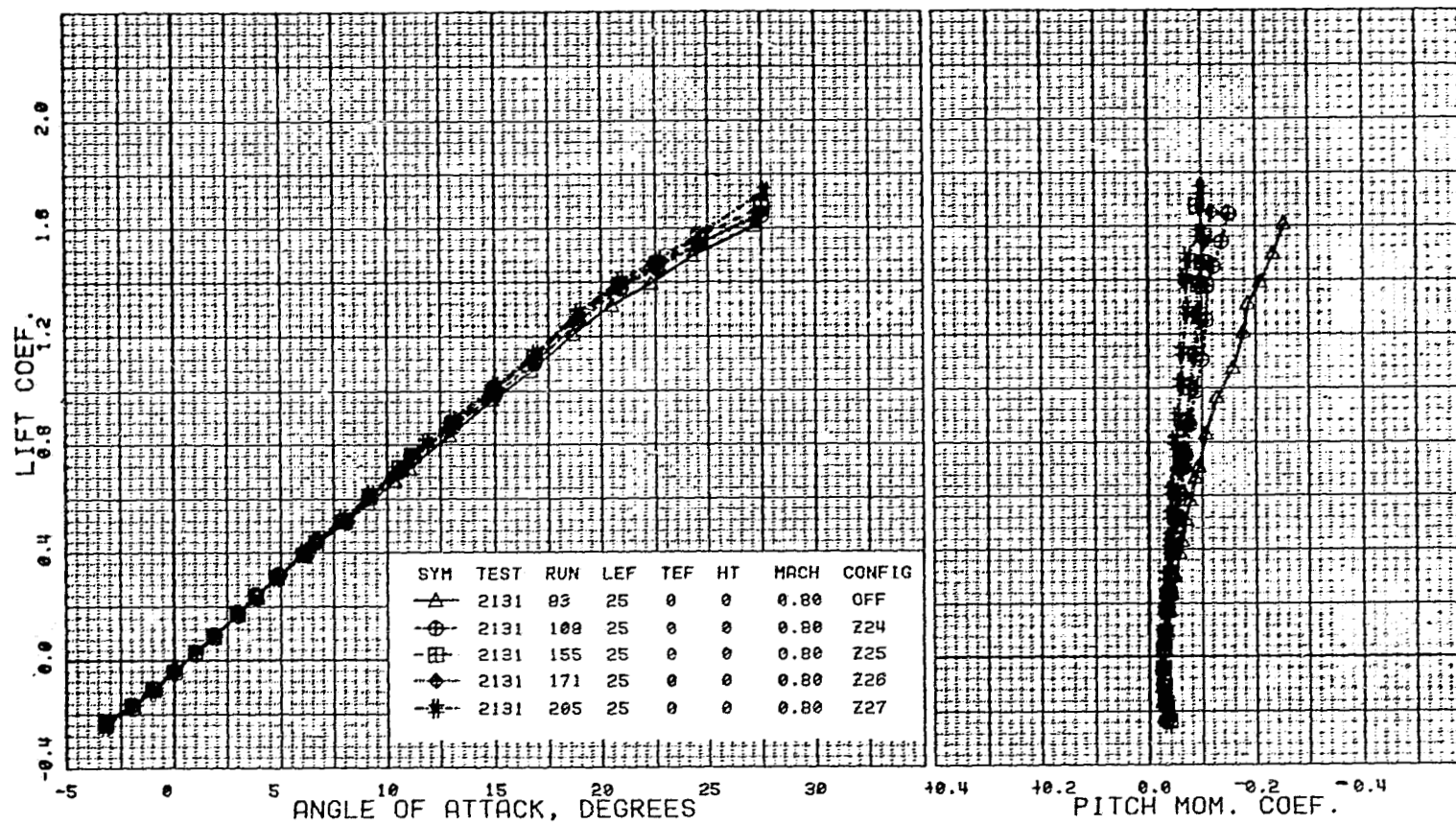


Figure 3-46 Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 25°, M = 0.80
(a) Lift and Pitching Moment

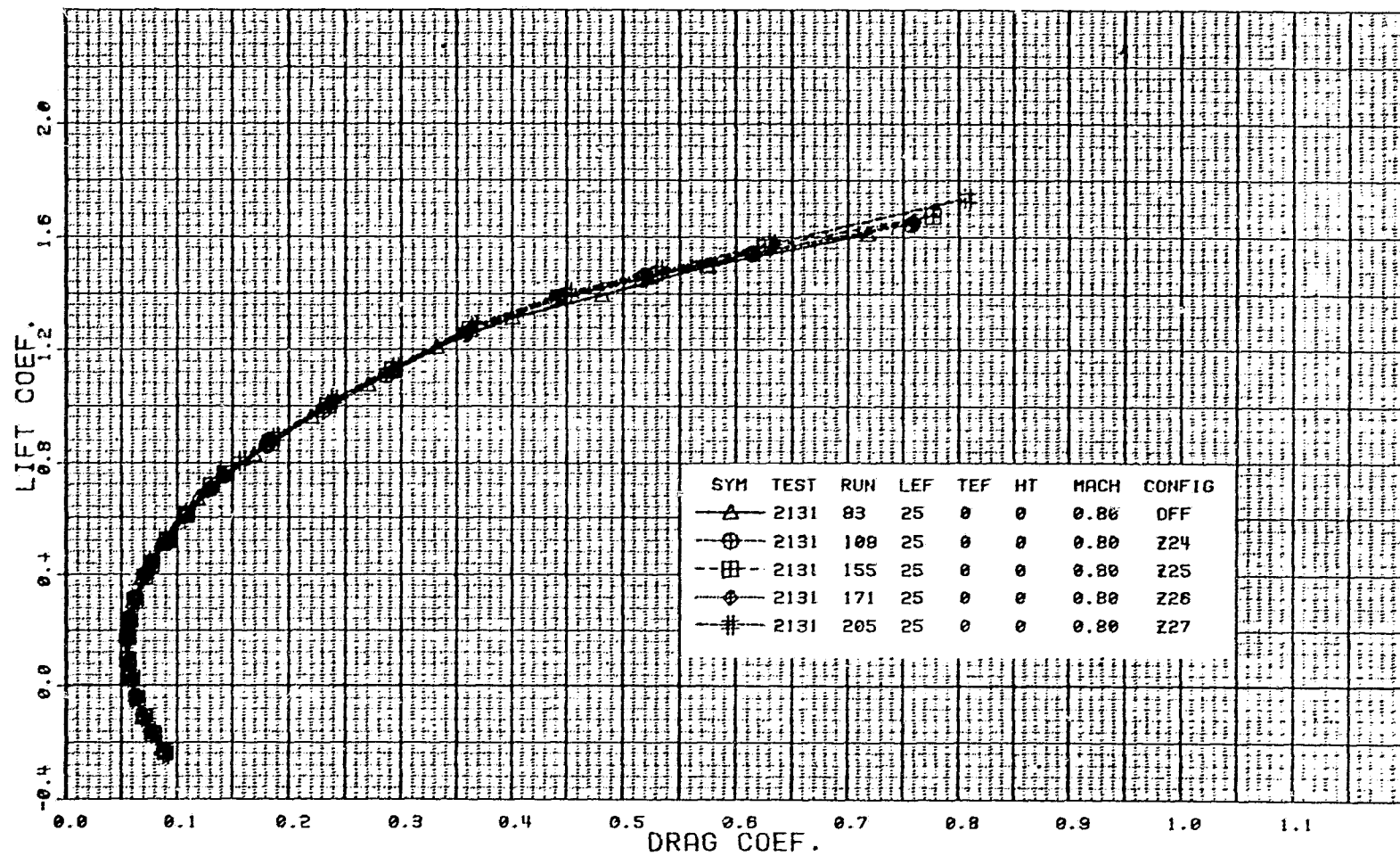


Figure 3-46 (b) Drag, Large Scale

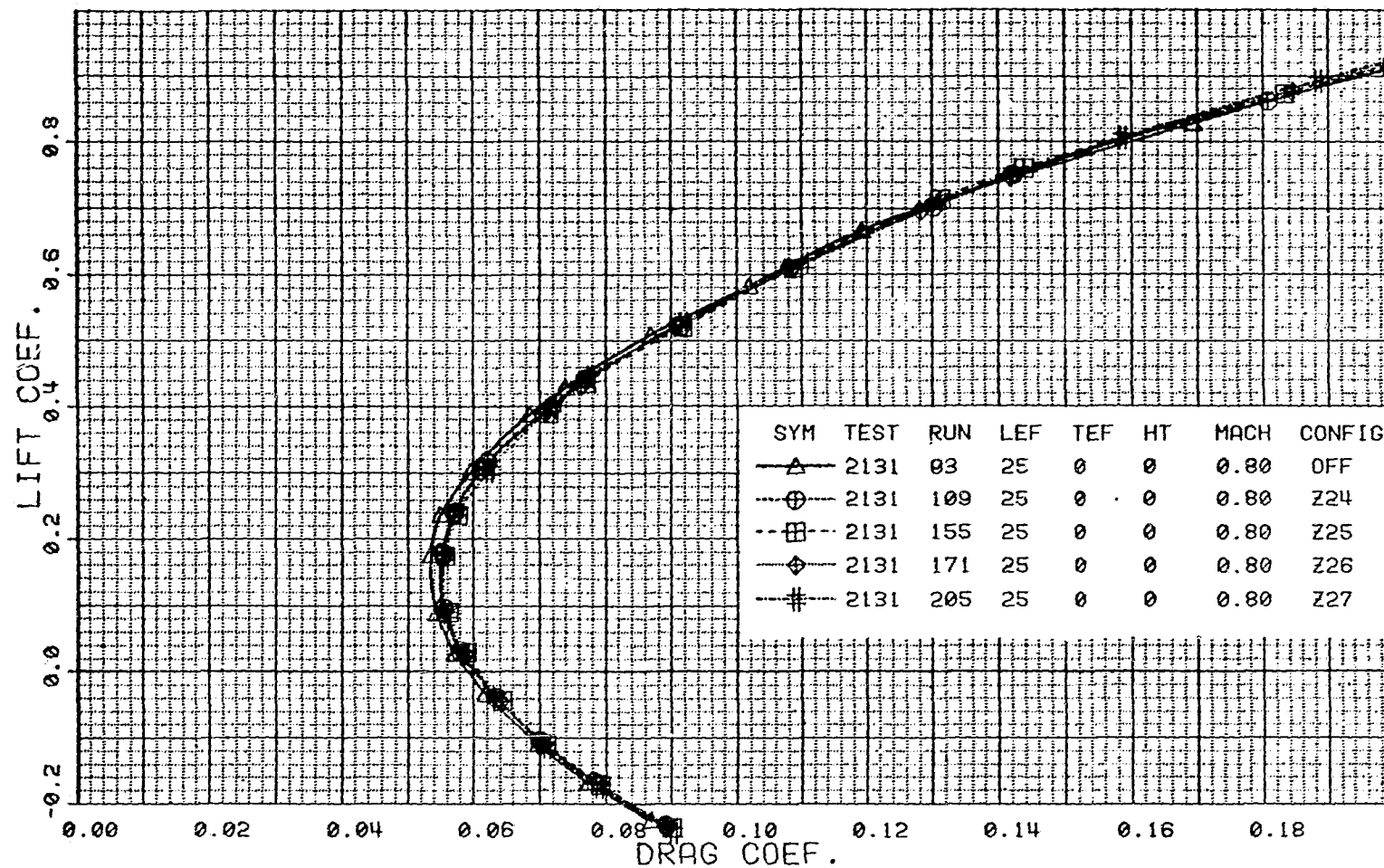


Figure 3-46 (c) Drag, Small Scale'

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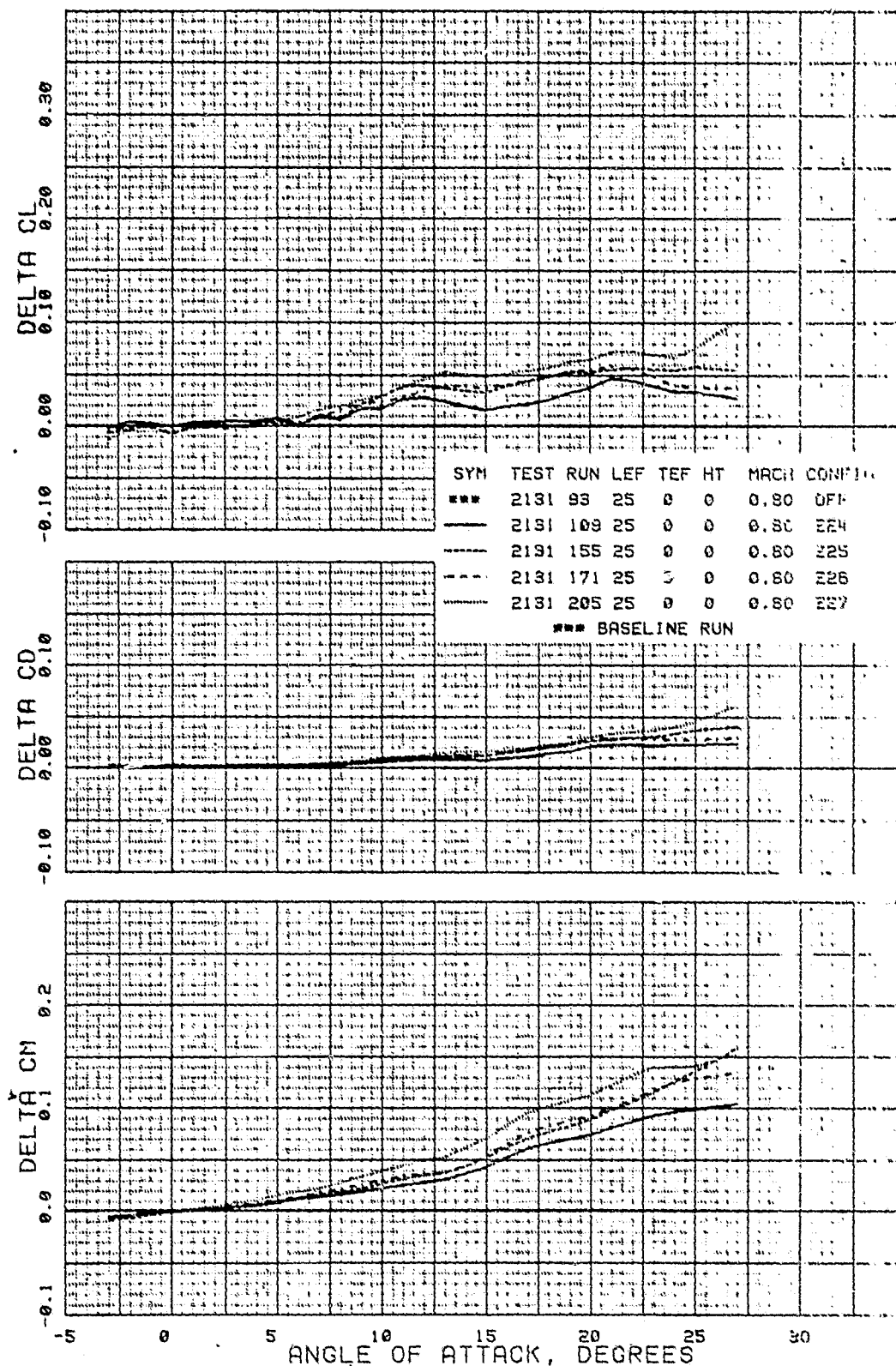


Figure 3-46 (d) Increments

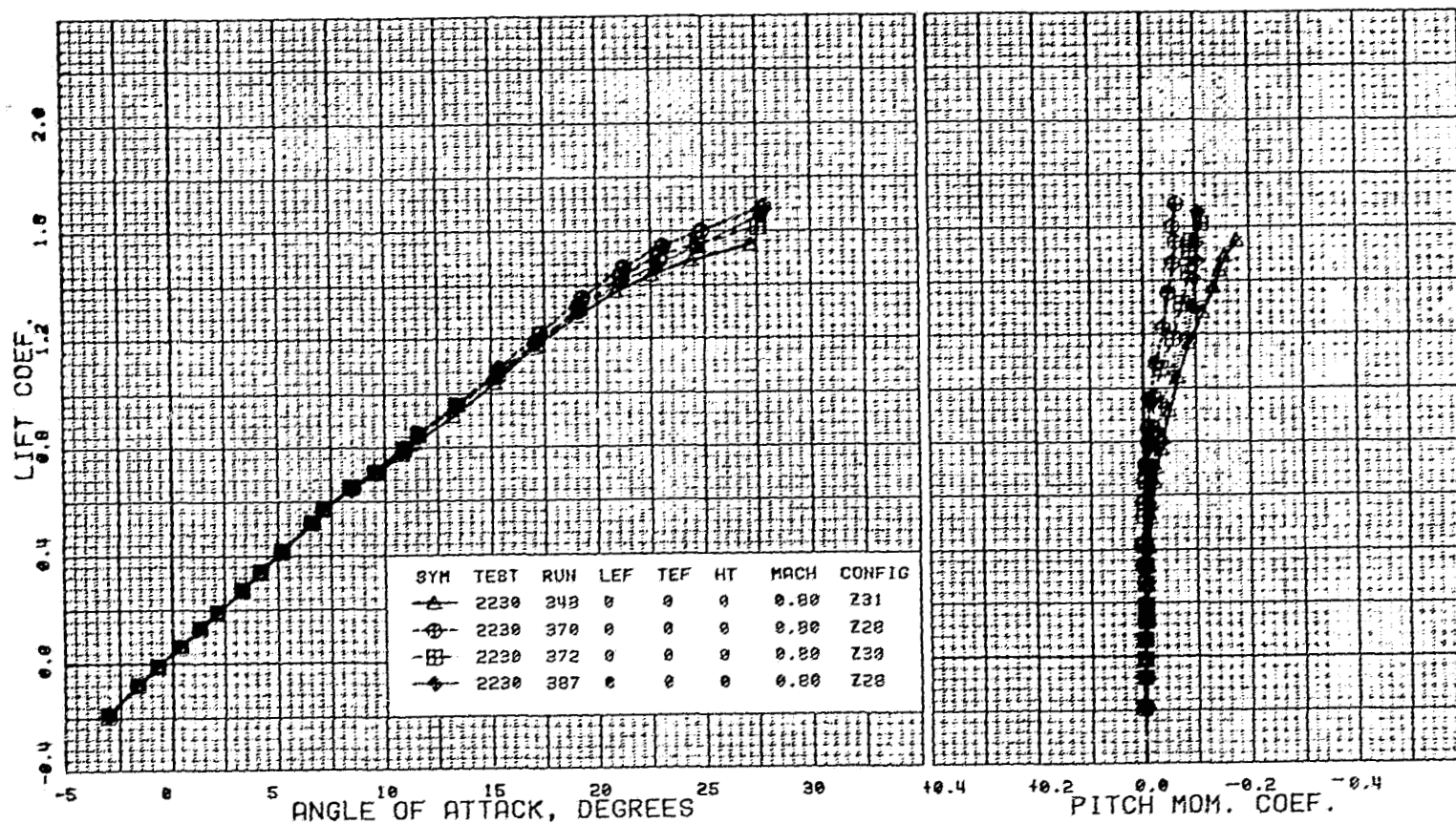


Figure 3-47 Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

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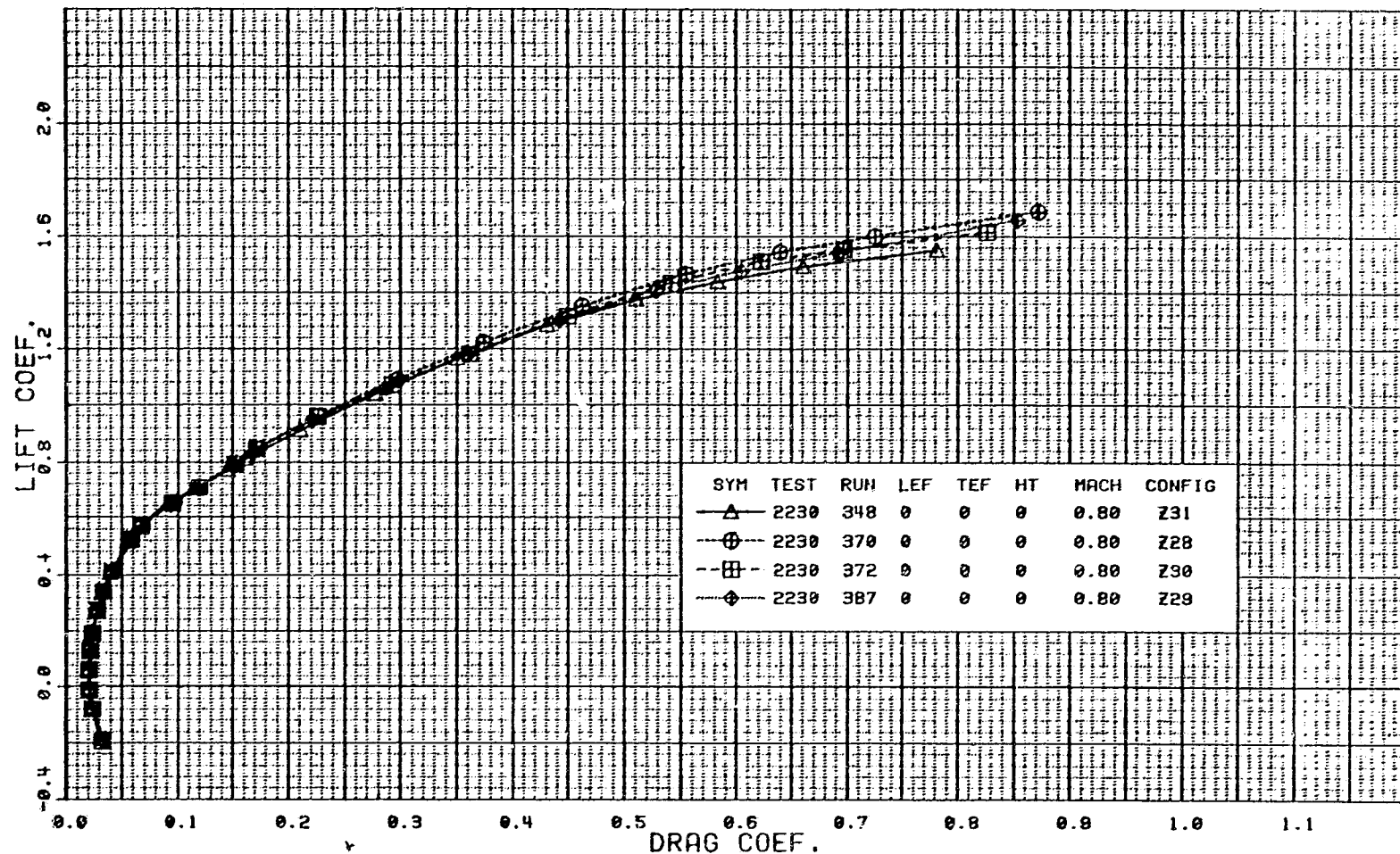


Figure 3-47 (b) Drag, Large Scale

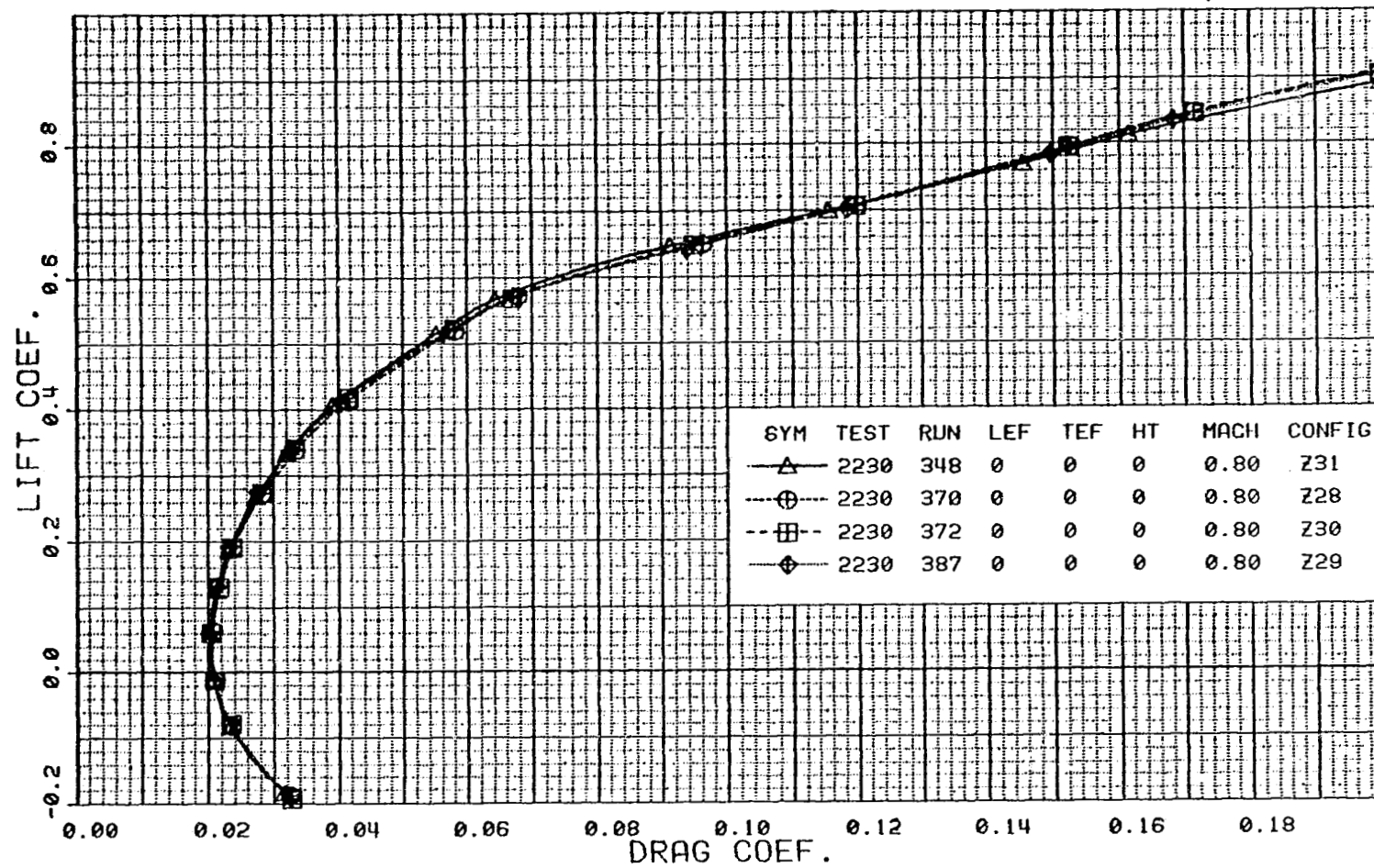


Figure 3-47 (c) Drag, Small Scale

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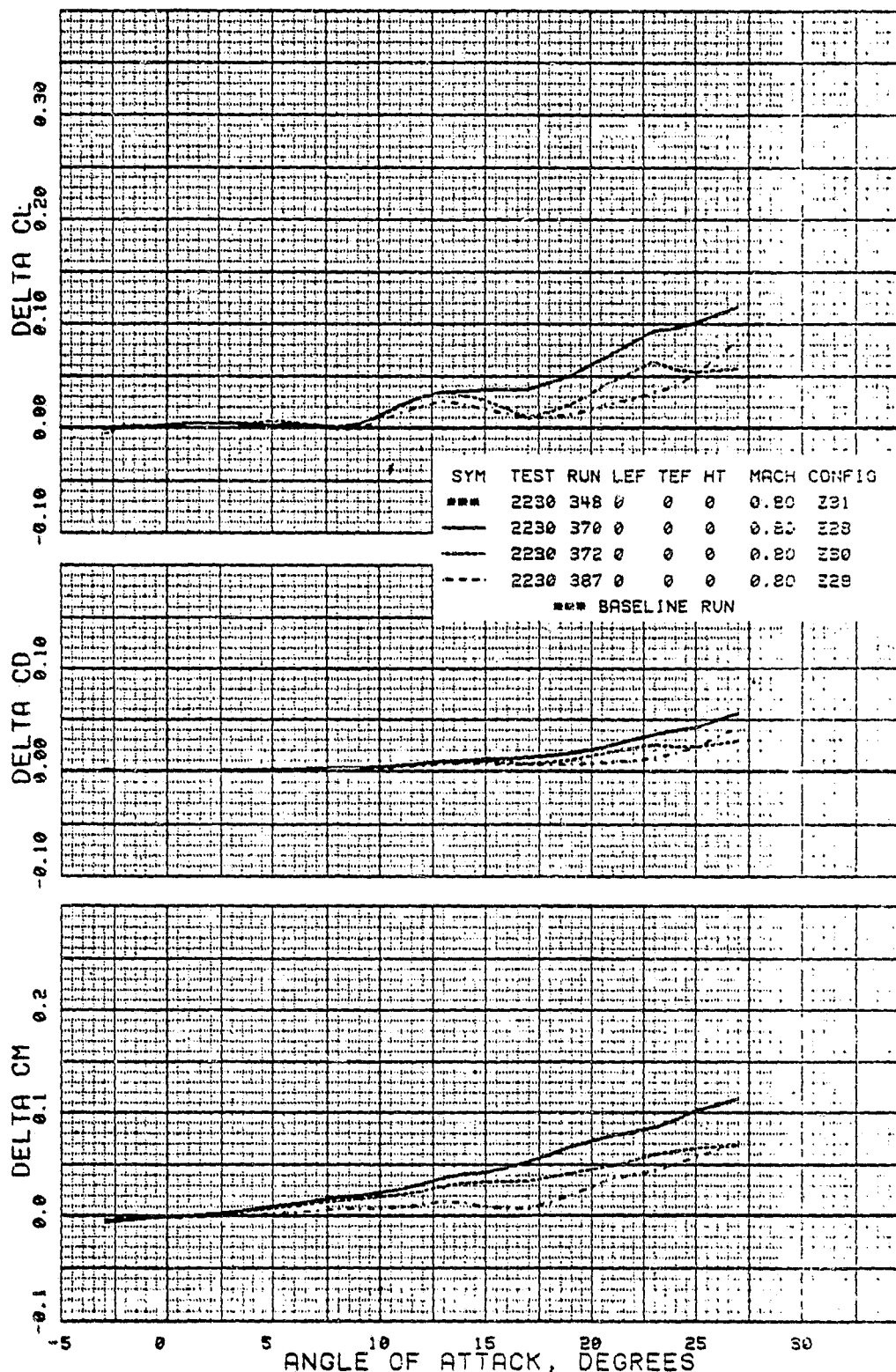


Figure 3-47 (d) Increments

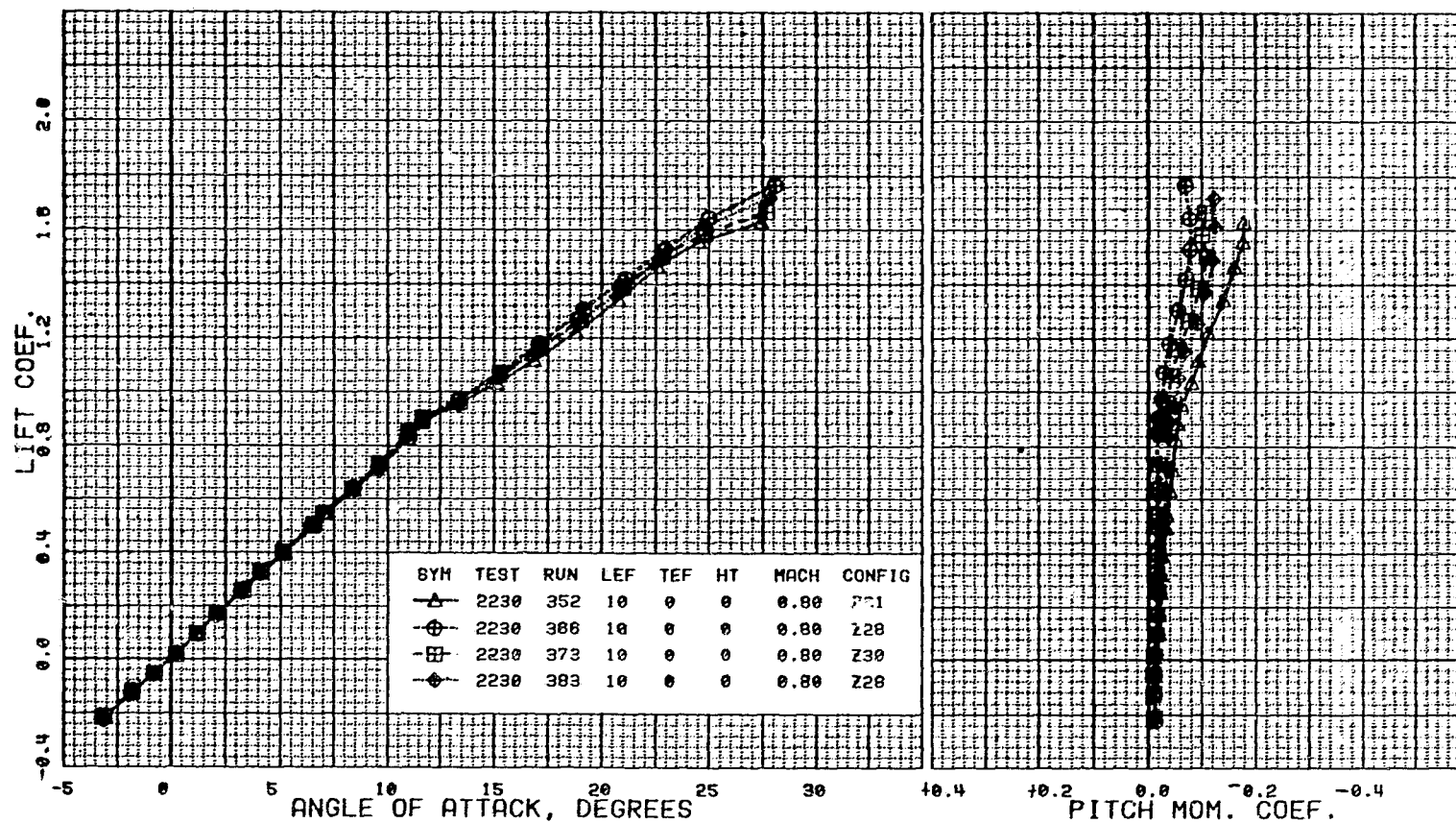


Figure 3-48 Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 10°, M = 0.80
(a) Lift and Pitching Moment

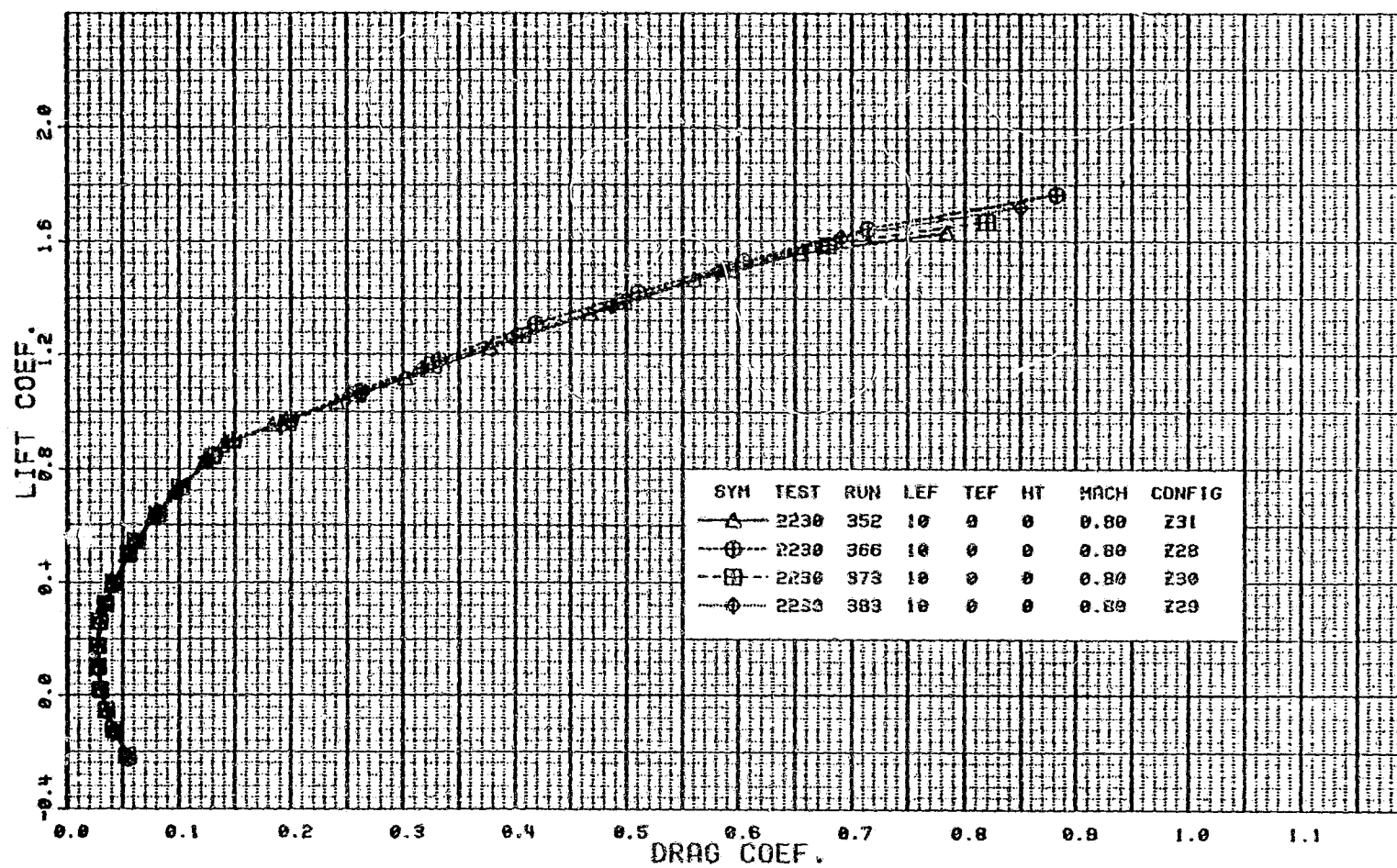


Figure 3-48 (b) Drag, Large Scale

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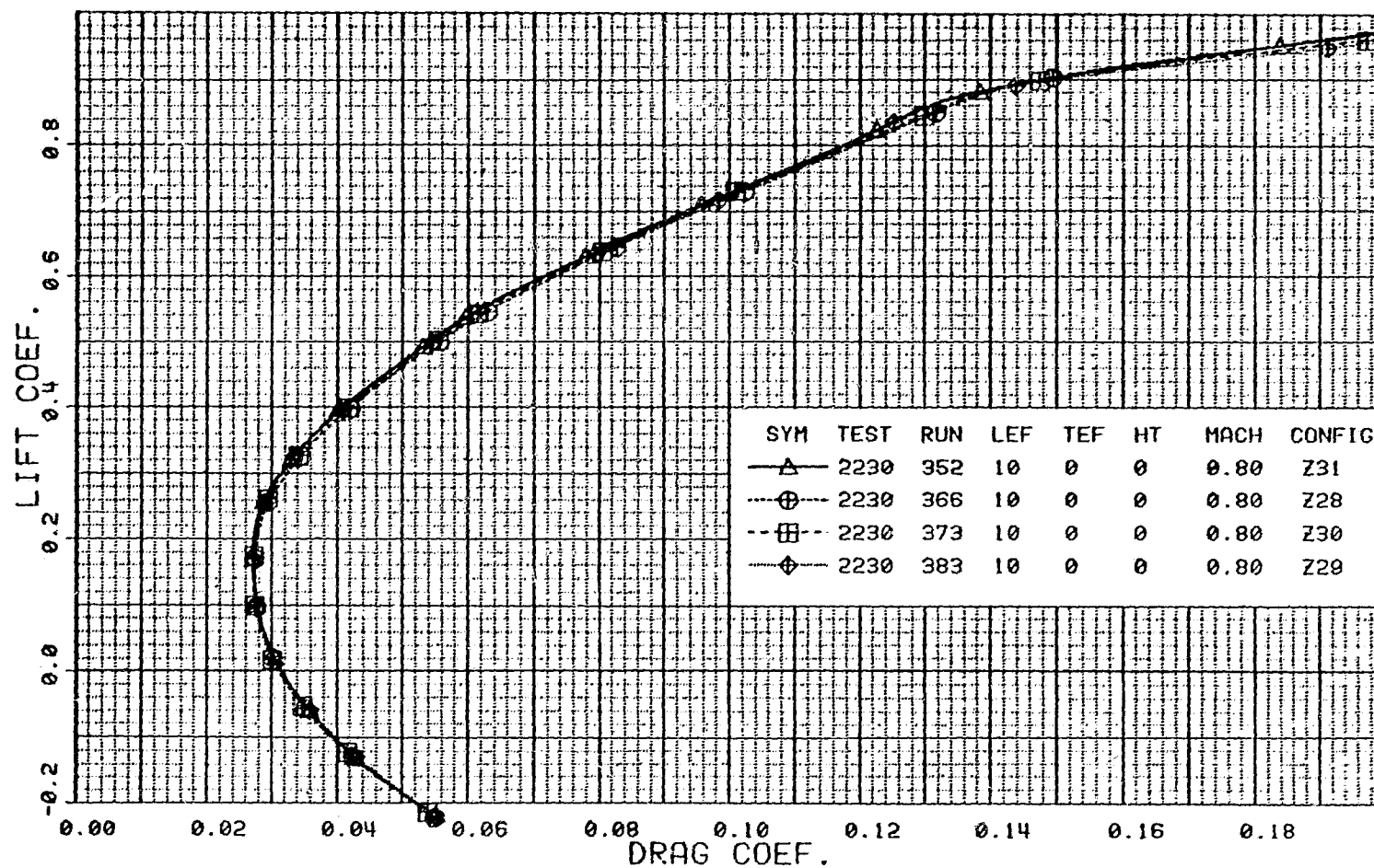


Figure 3-48 (c) Drag, Small Scale

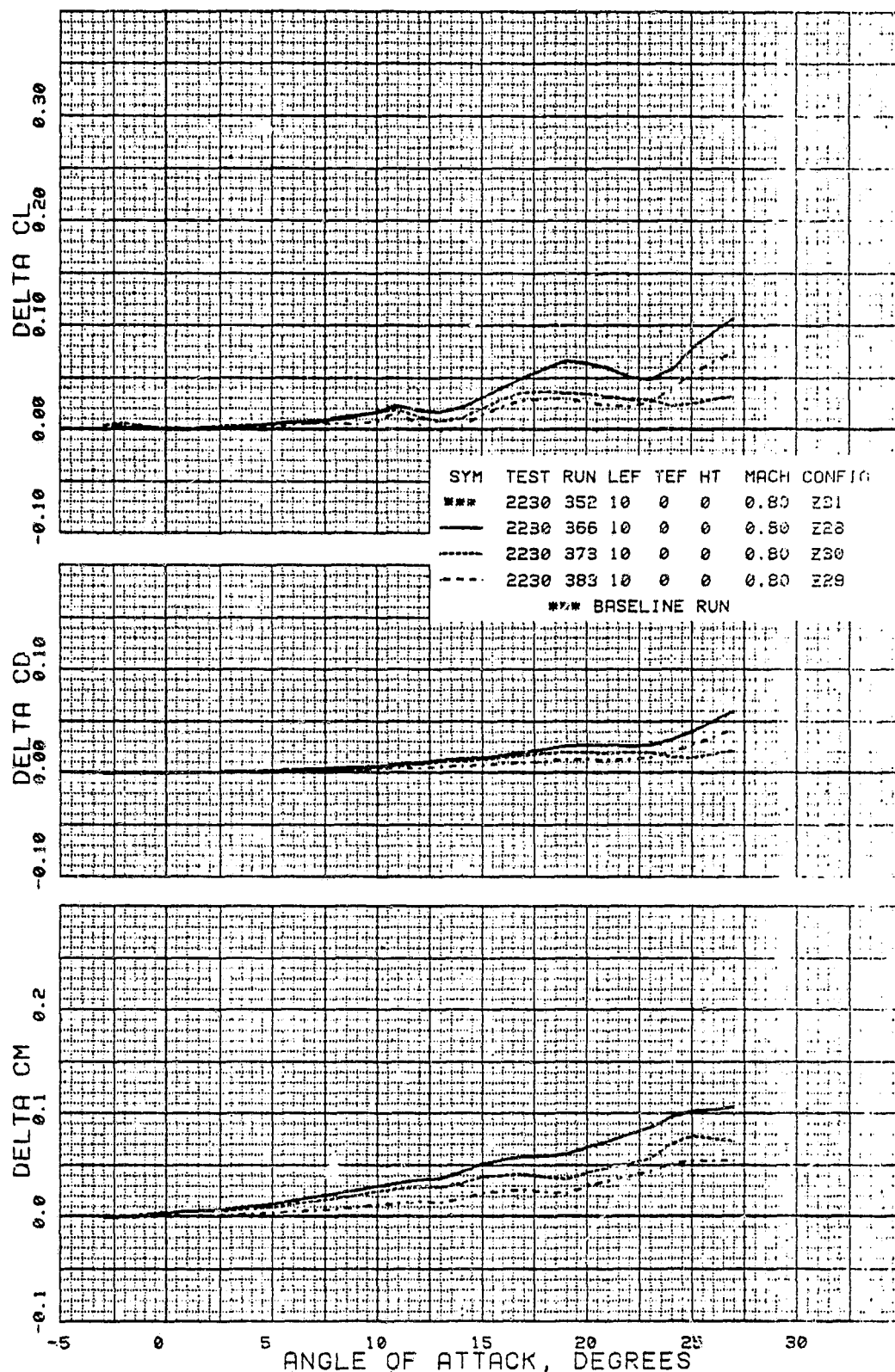


Figure 3-48 (d) Increments

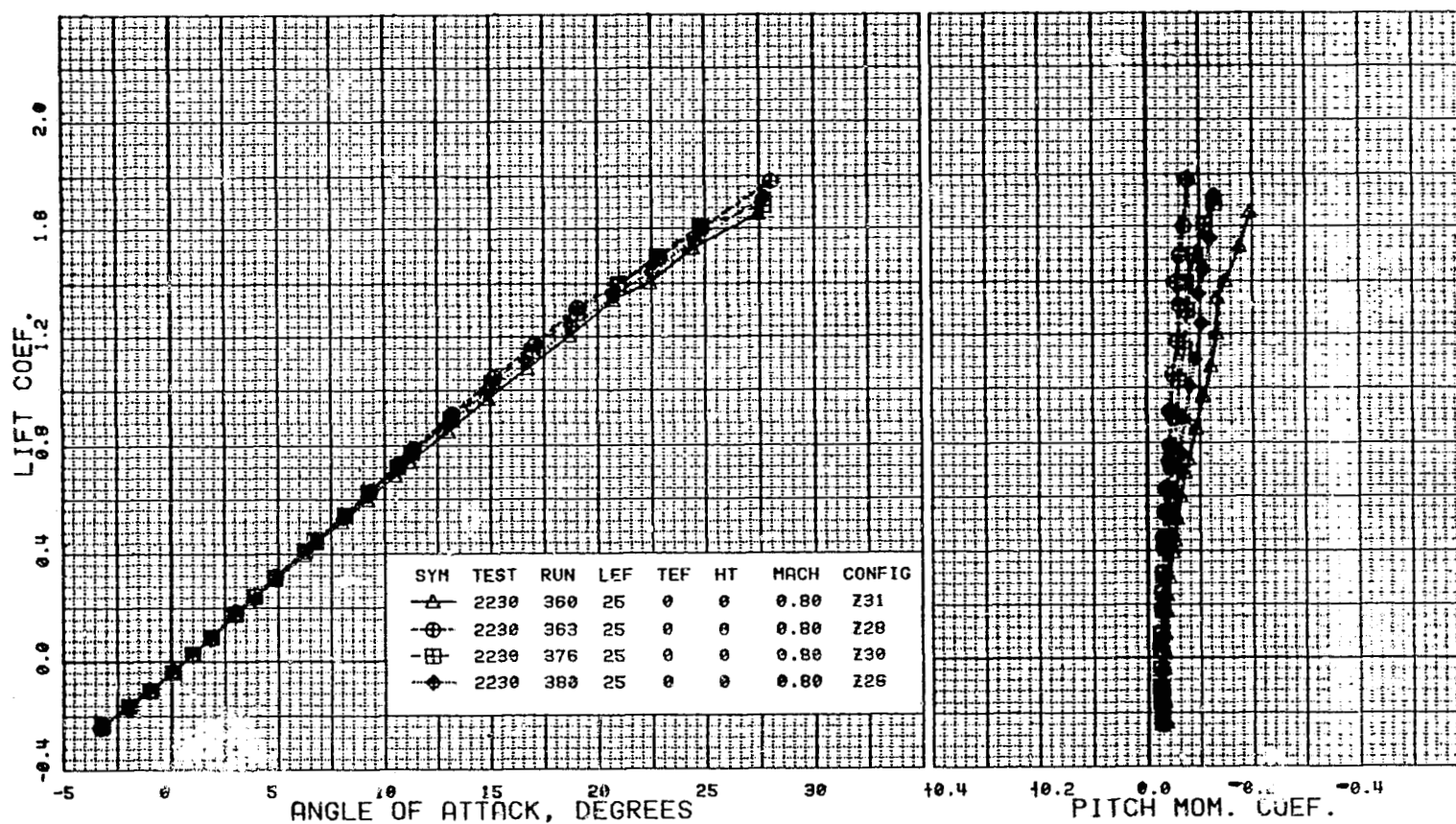


Figure 3-49 Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 25°, M = 0.80
(a) Lift and Pitching Moment

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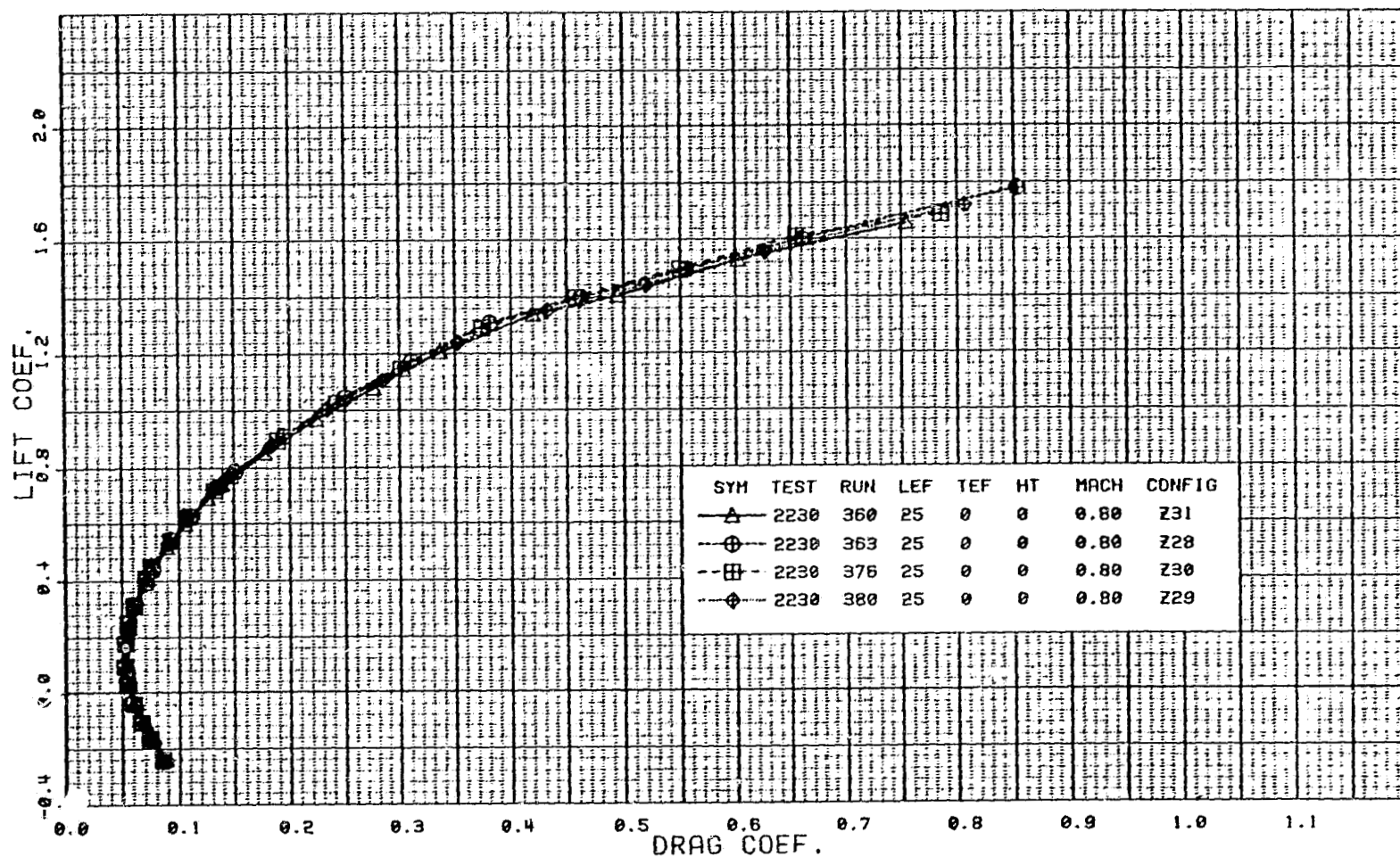


Figure 3-49 (b) Drag, Large Scale

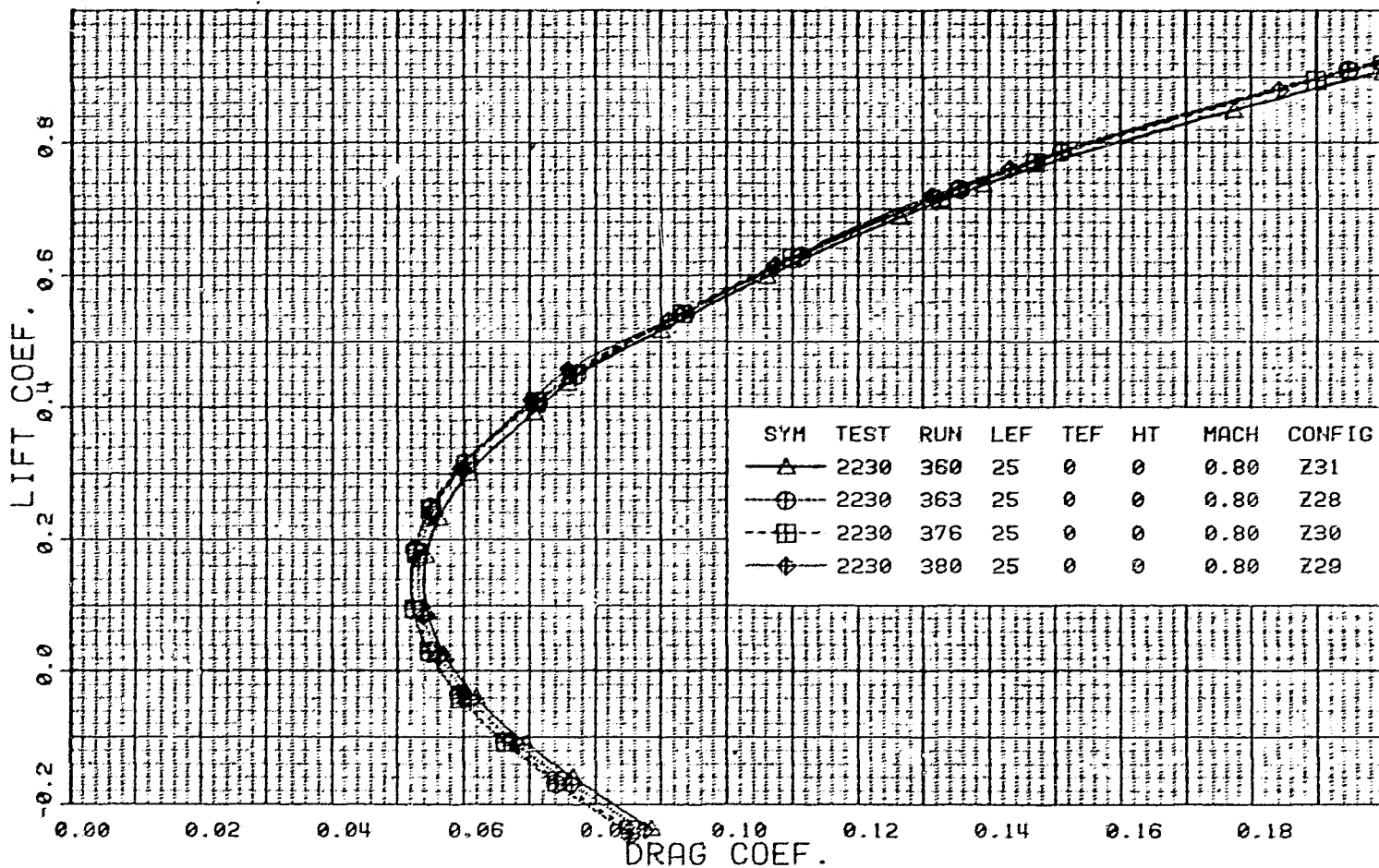


Figure 3-49 (c) Drag, Small Scale

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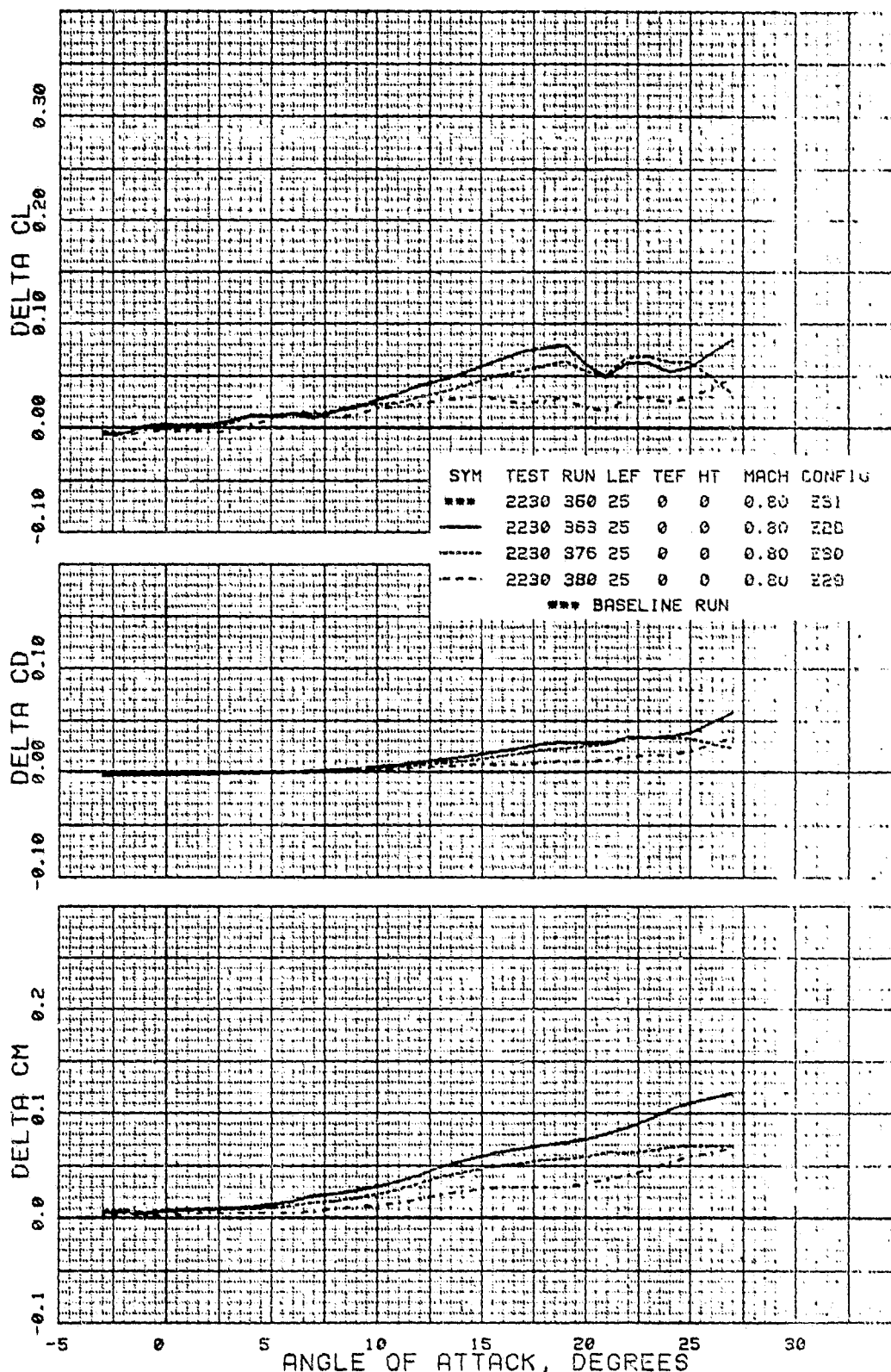


Figure 3-49 (d) Increments

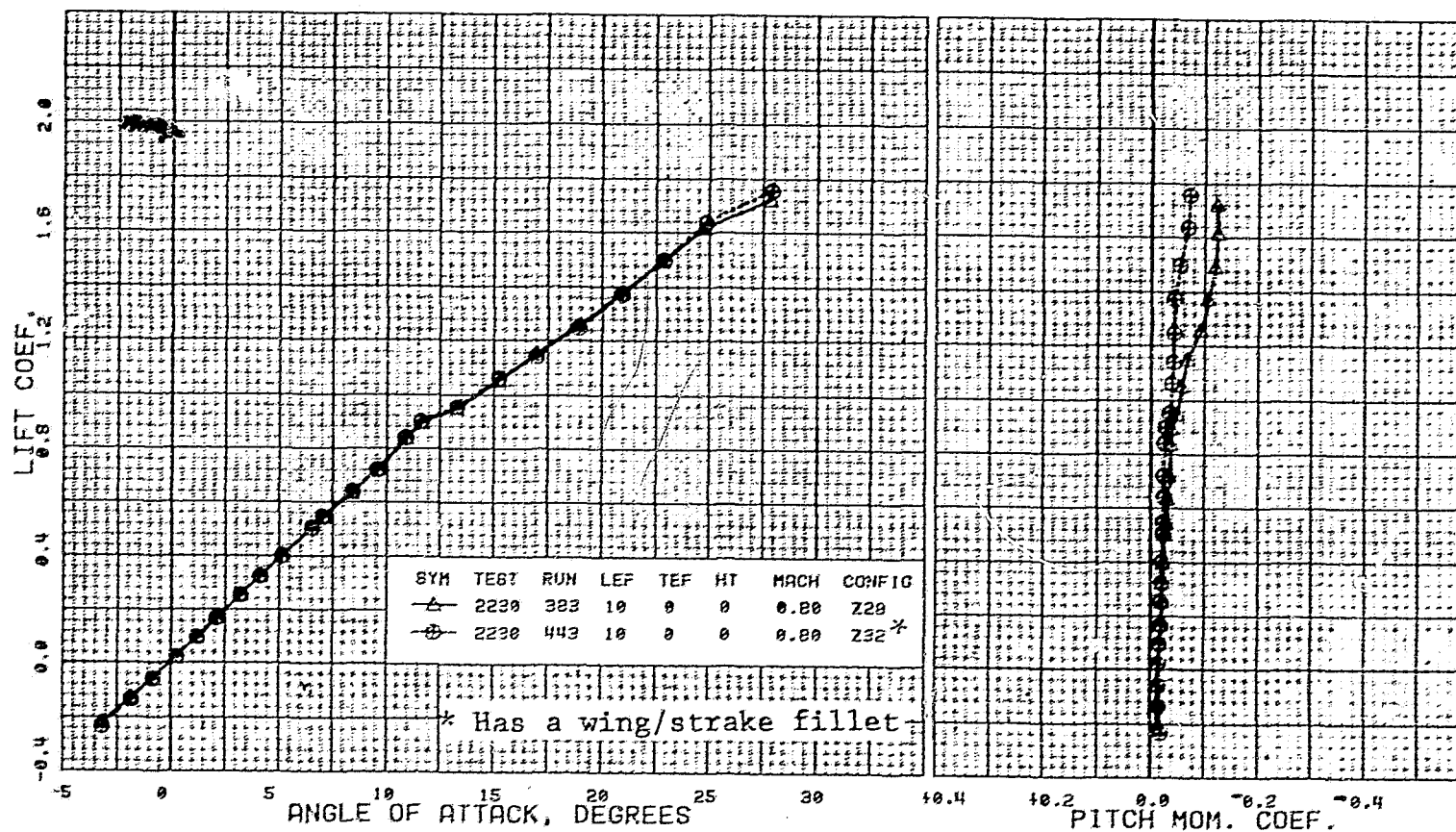


Figure 3-50 Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 10° , M = 0.80
(a) Lift and Pitching Moment

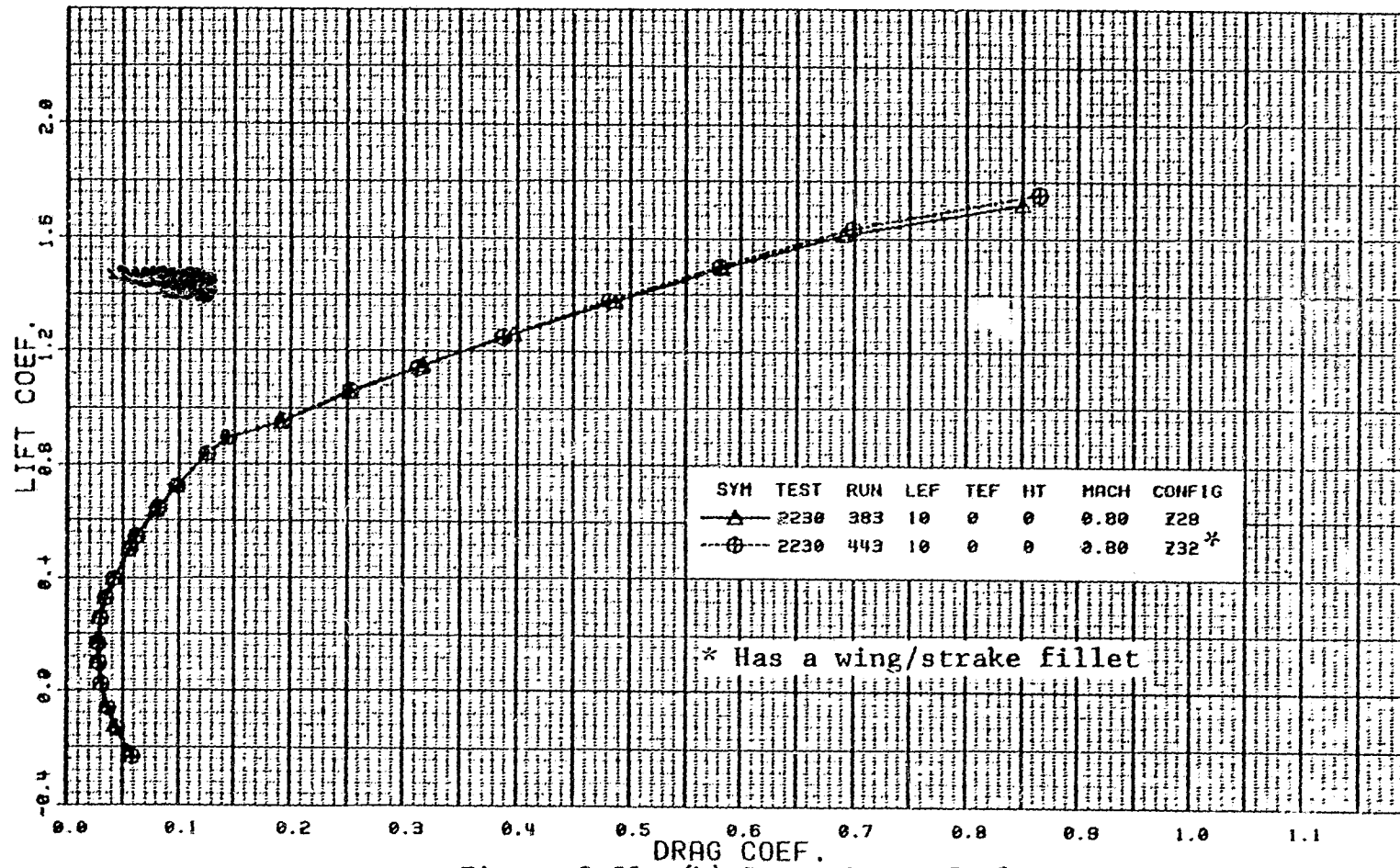


Figure 3-50 (b) Drag, Large Scale

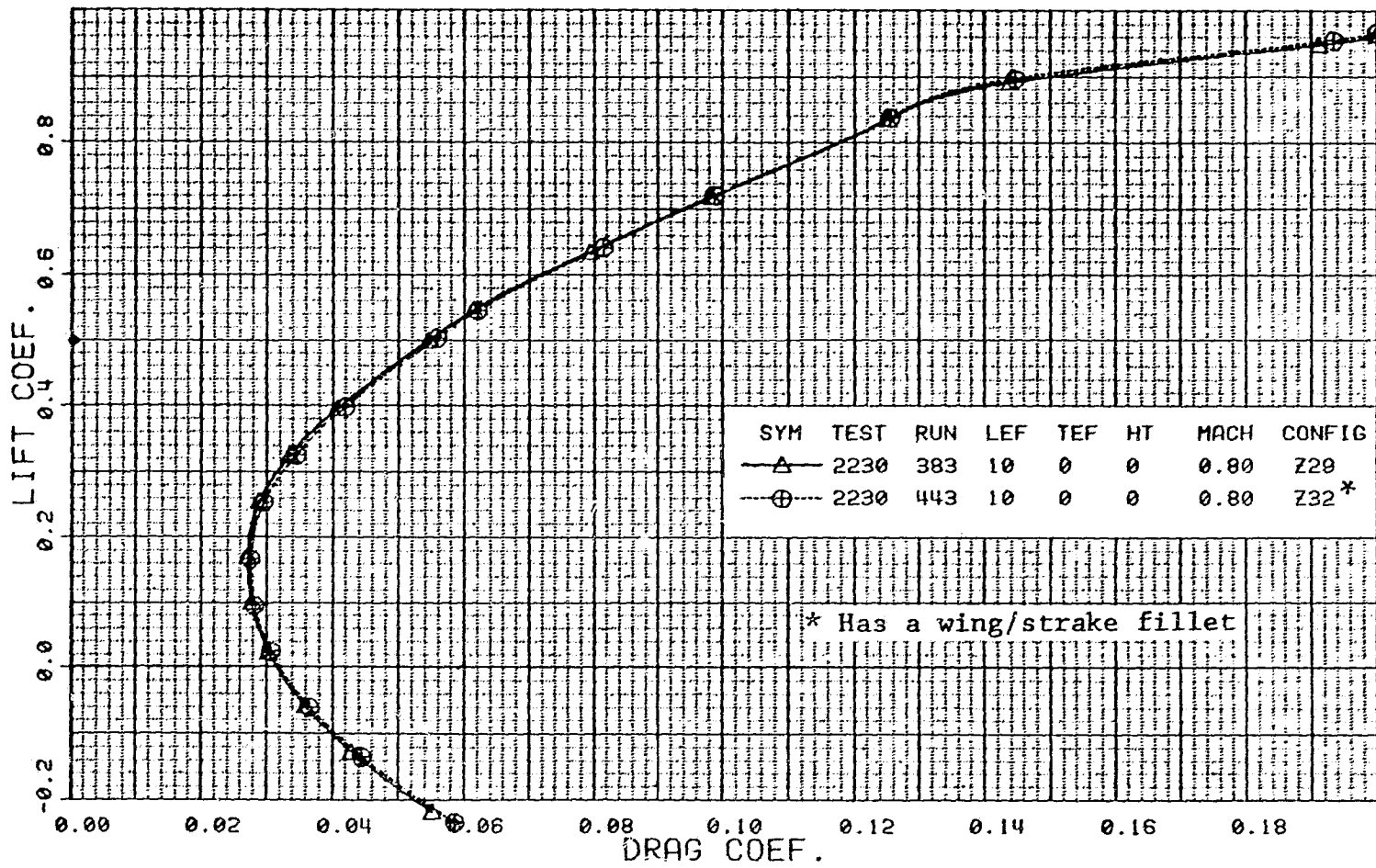


Figure 3-50 (c) Drag, Small Scale

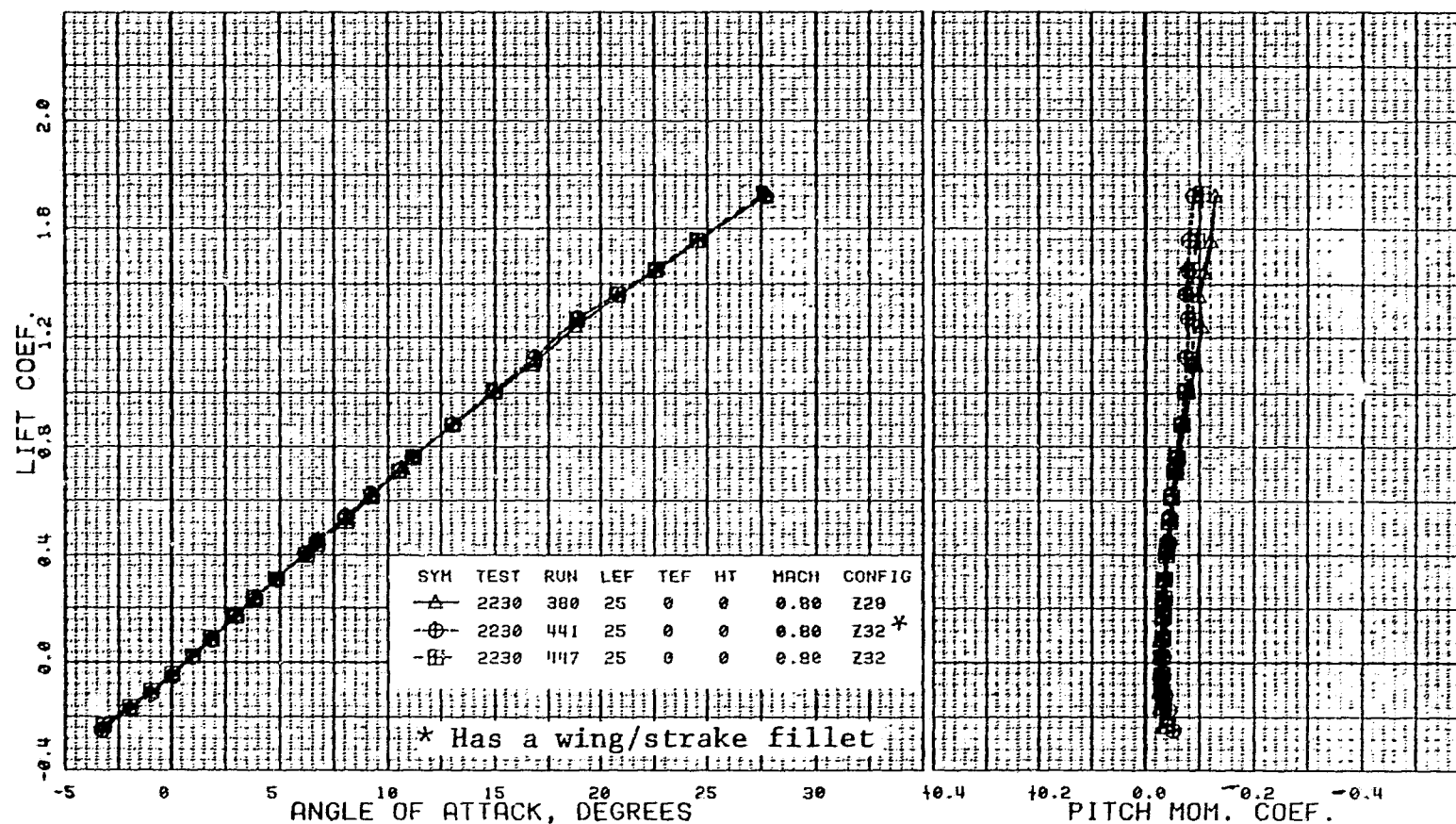


Figure 3-51 Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 25°, M = 0.80
(a) Lift and Pitching Moment

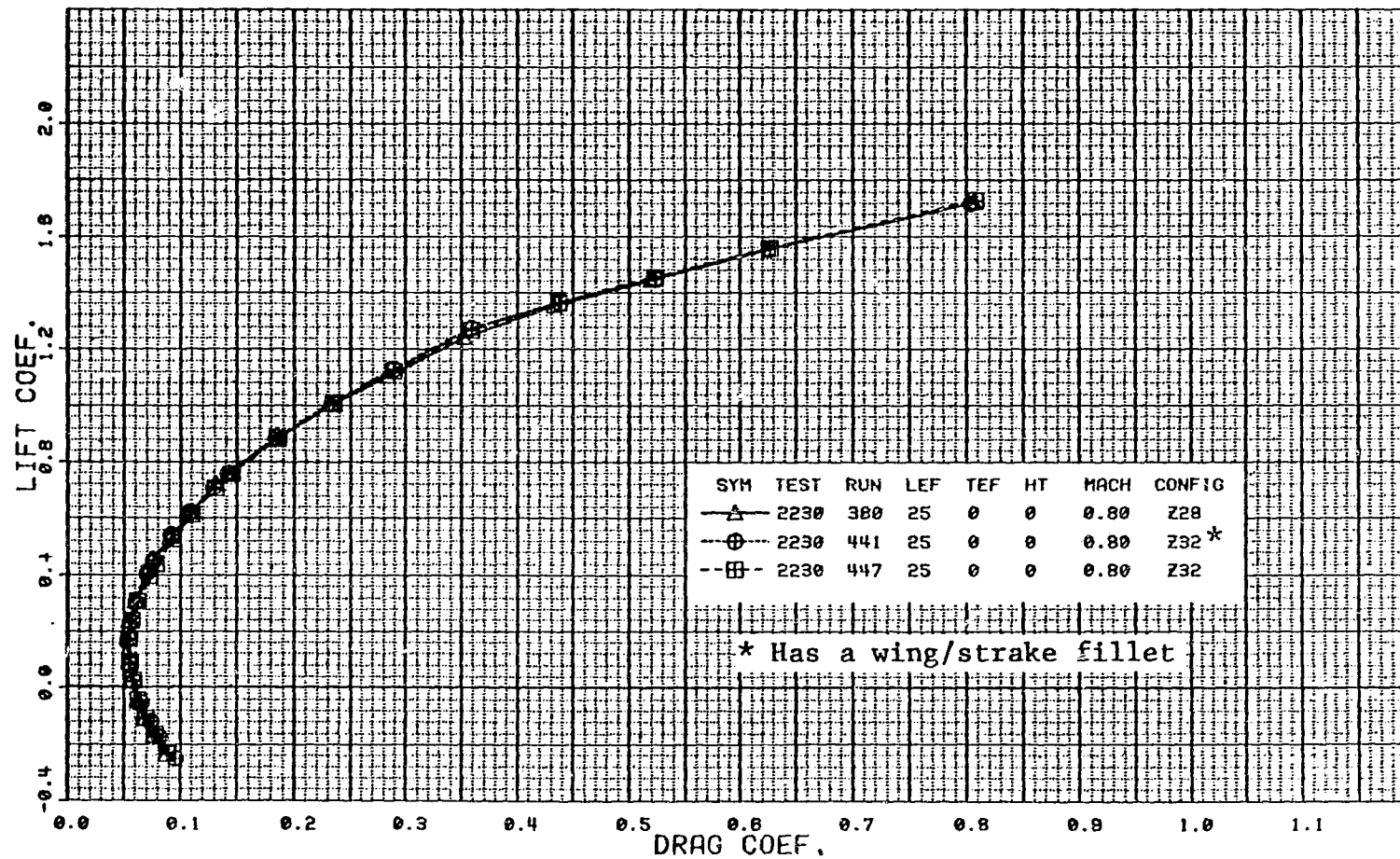


Figure 3-51 (b) Drag, Large Scale

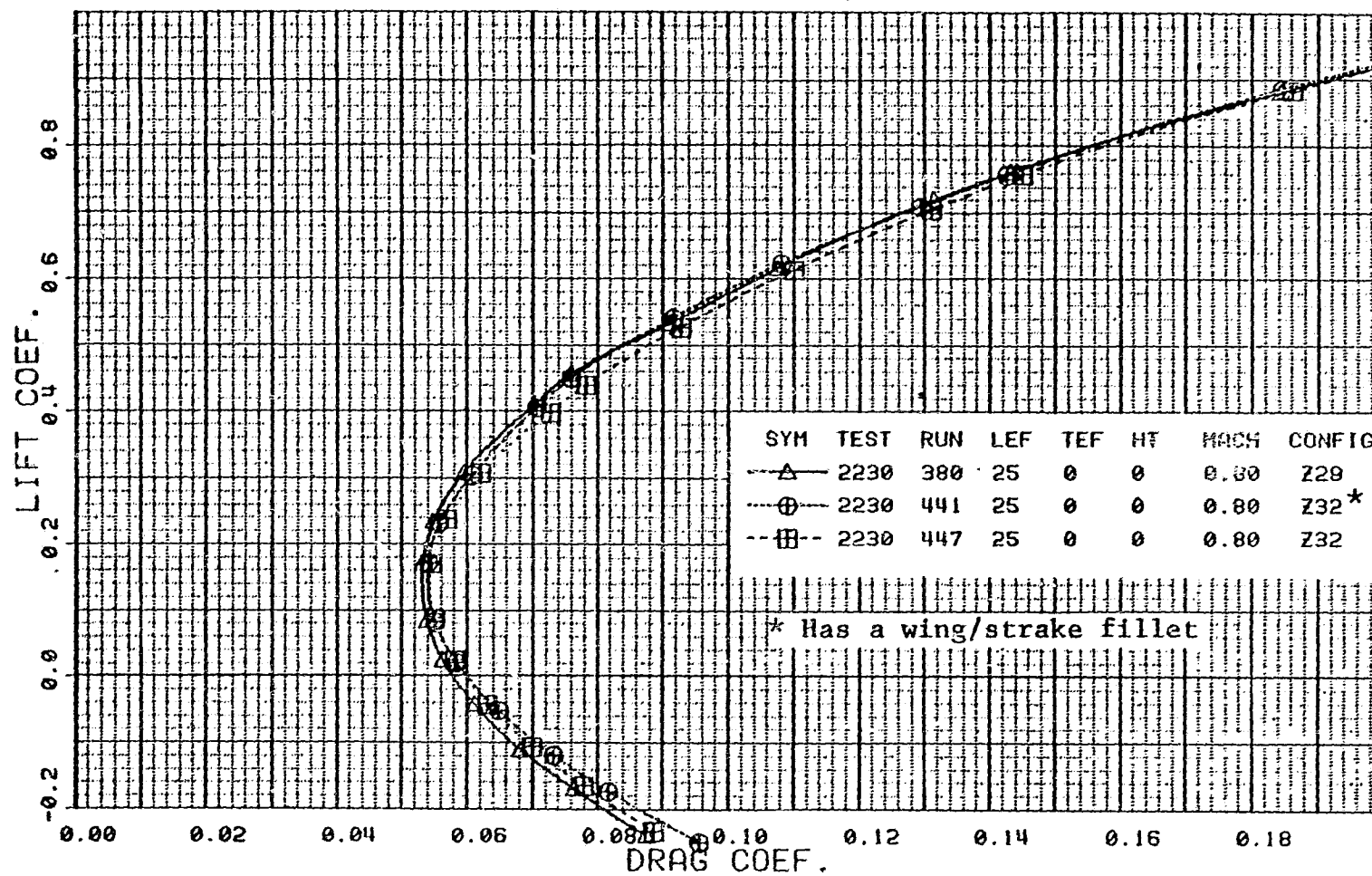


Figure 3-51 (c) Drag, Small Scale

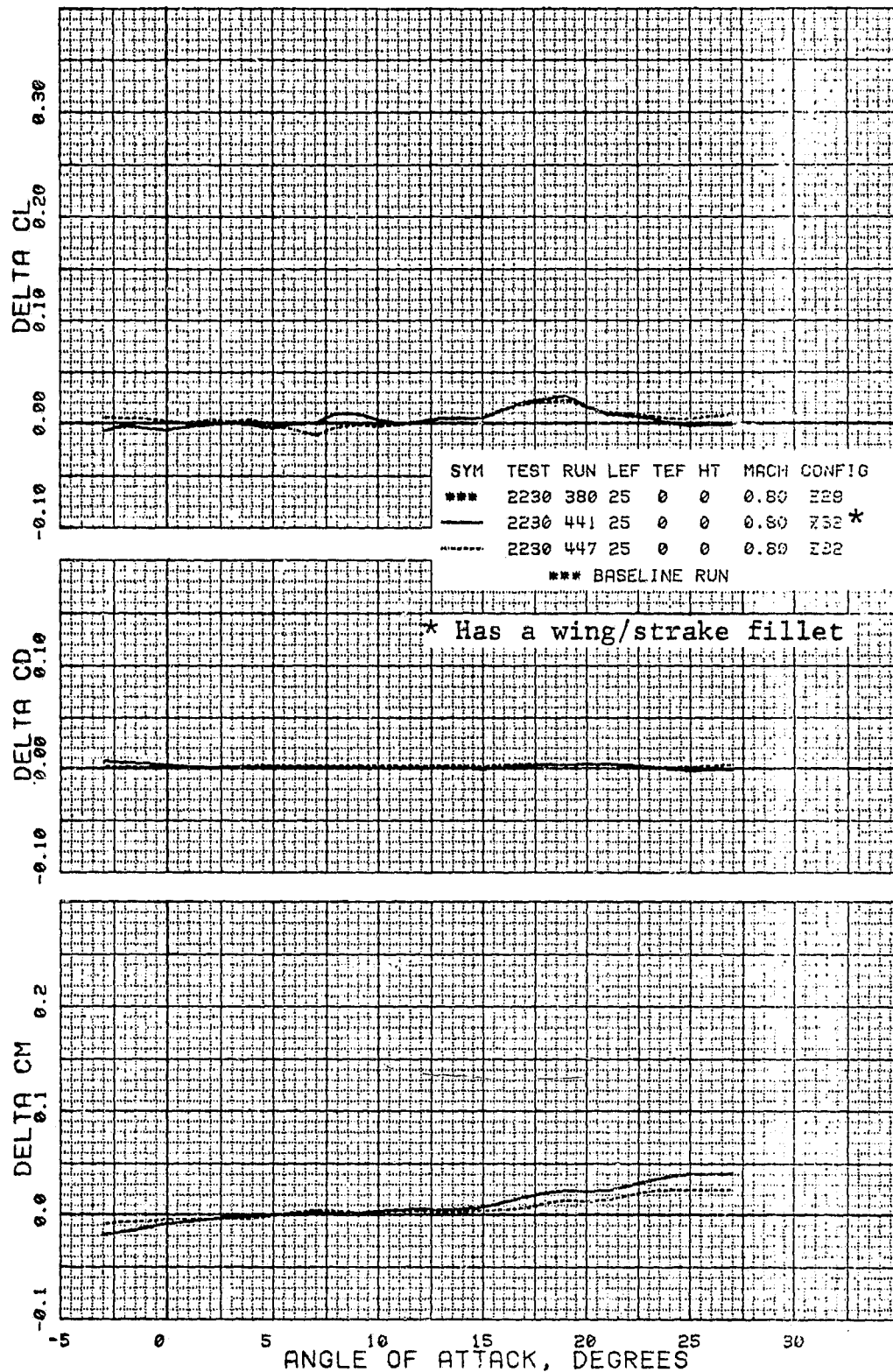


Figure 3-51 (d) Increments

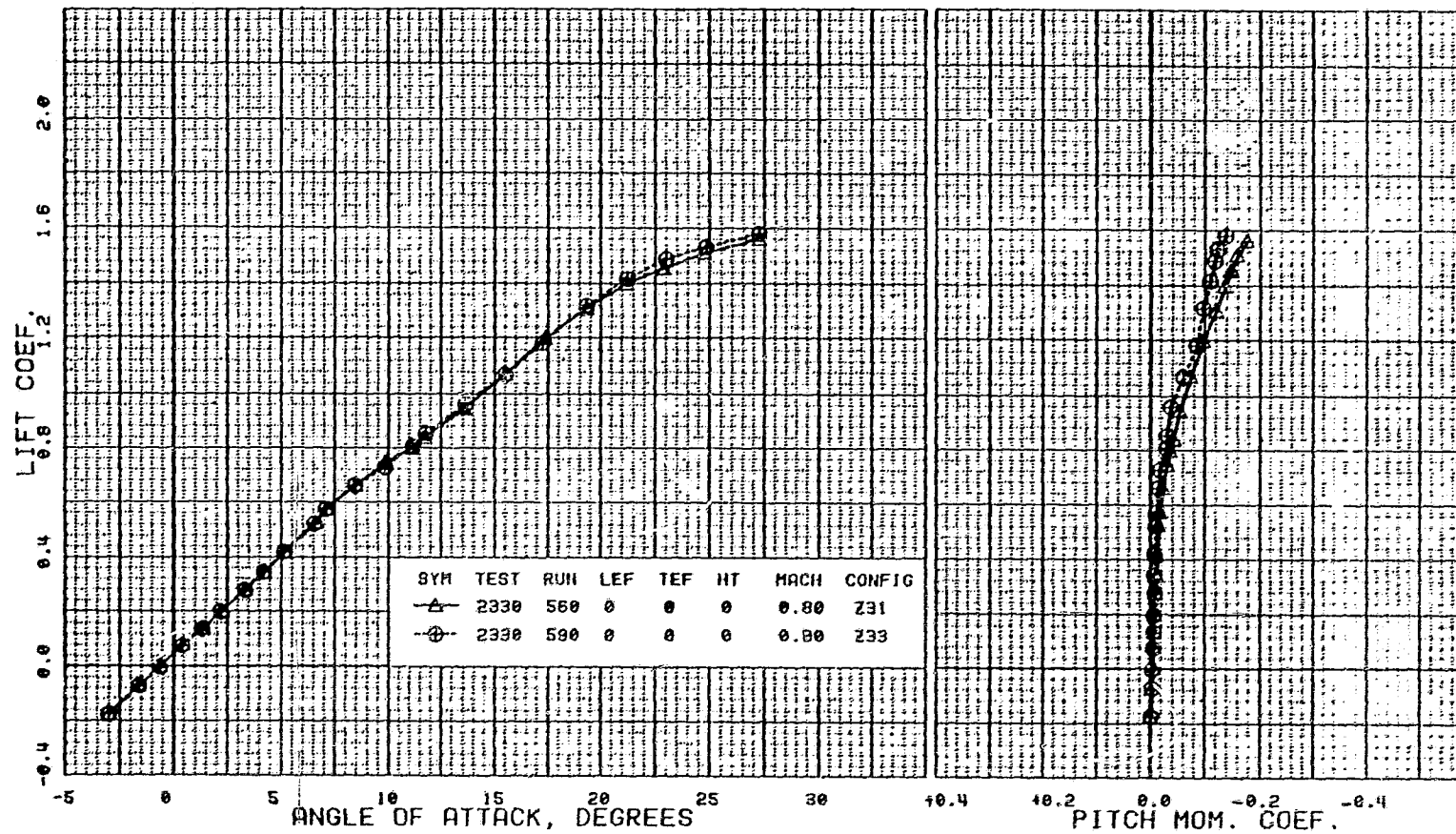


Figure 3-52 Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

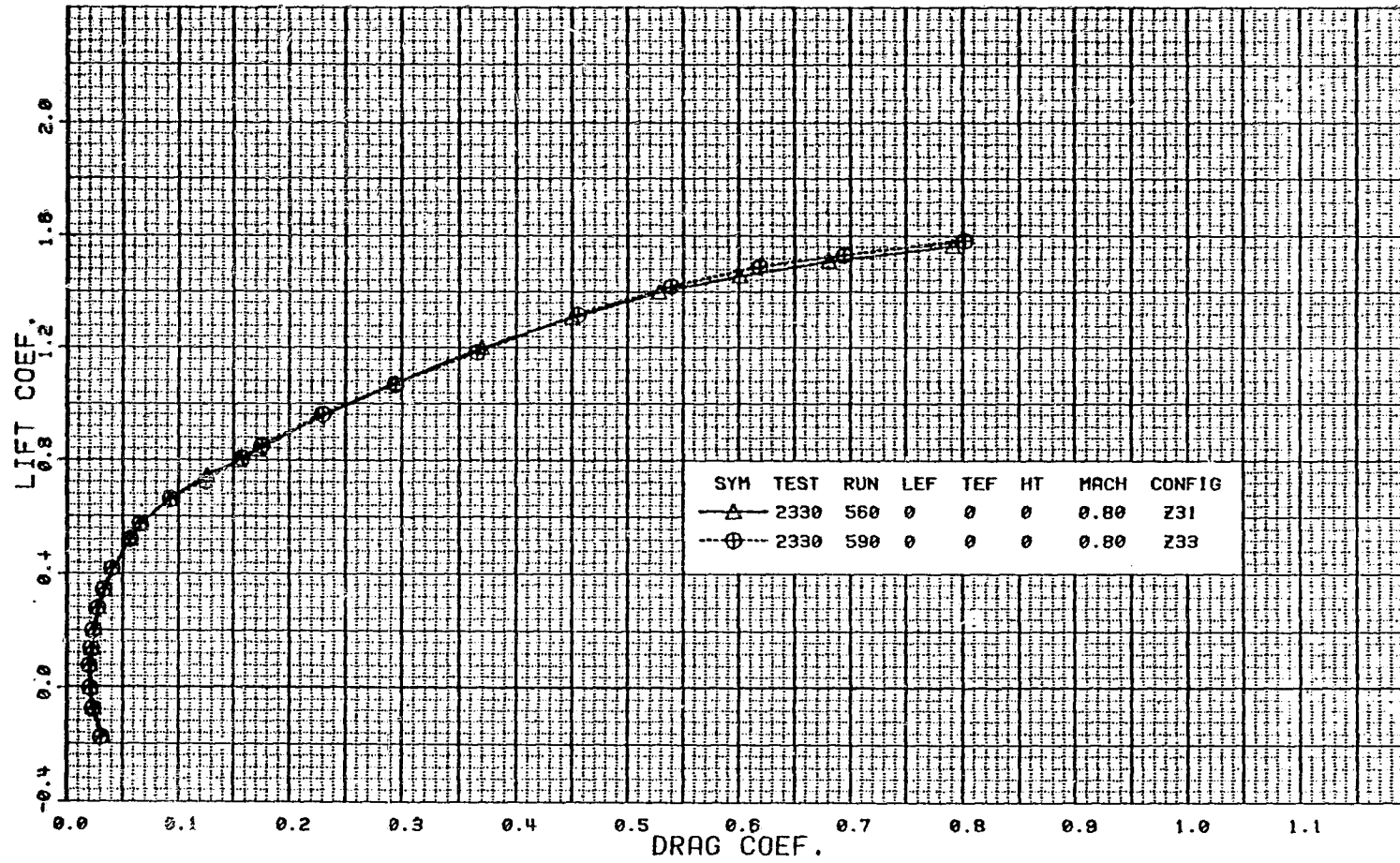


Figure 3-52 (b) Drag, Large Scale

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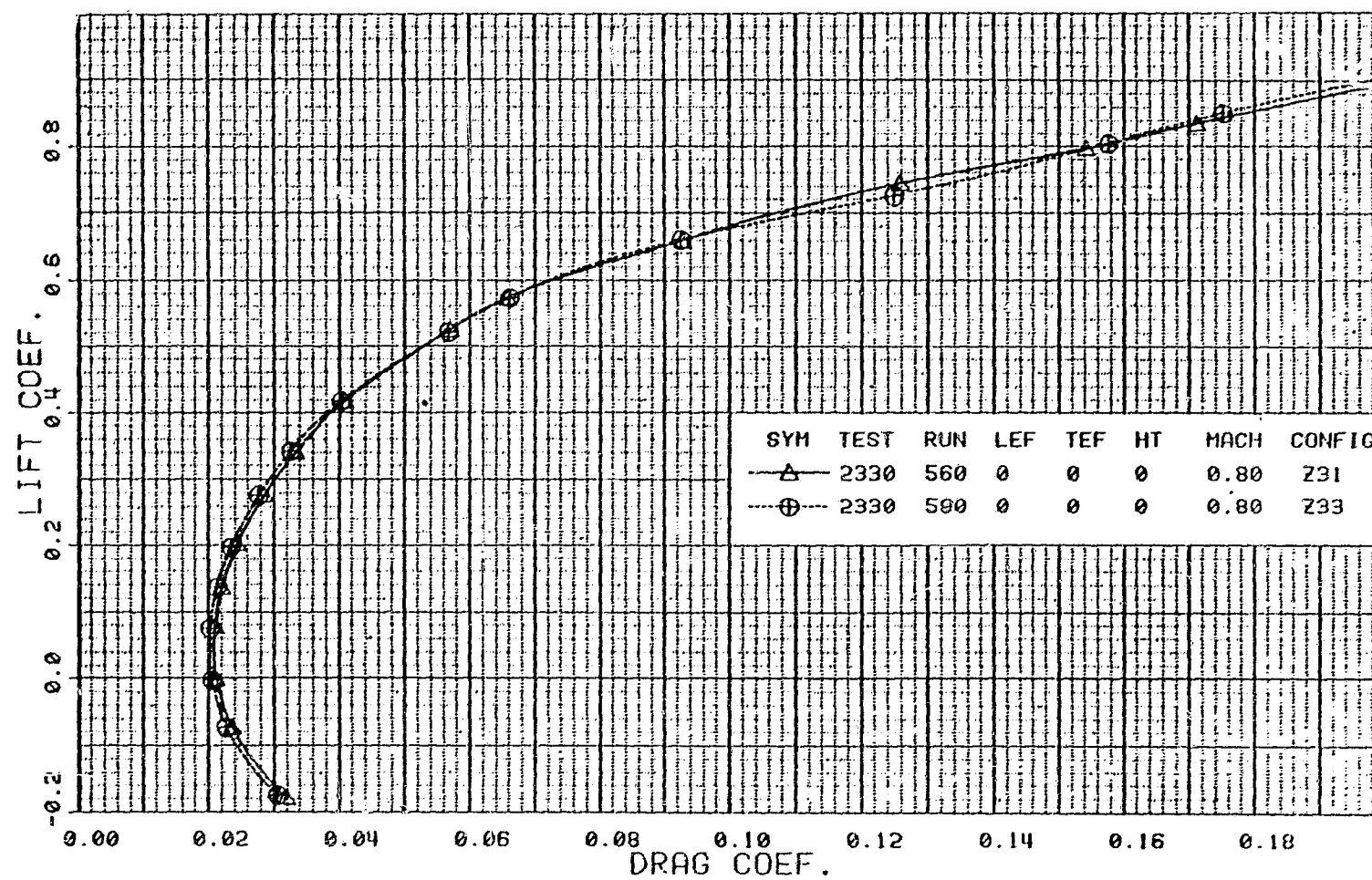


Figure 3-52 (c) Drag, Small Scale

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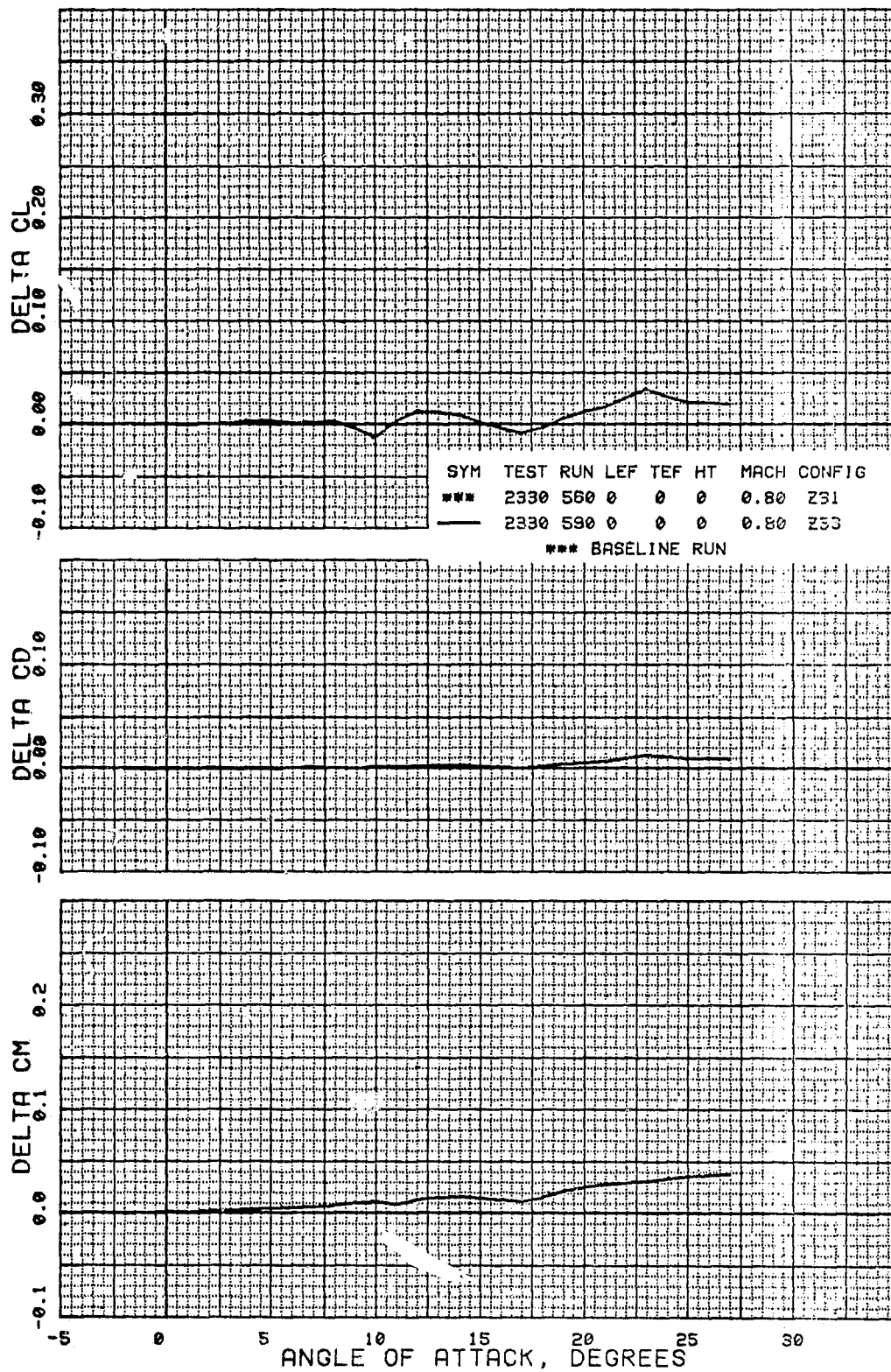


Figure 3-52 (d) Increments

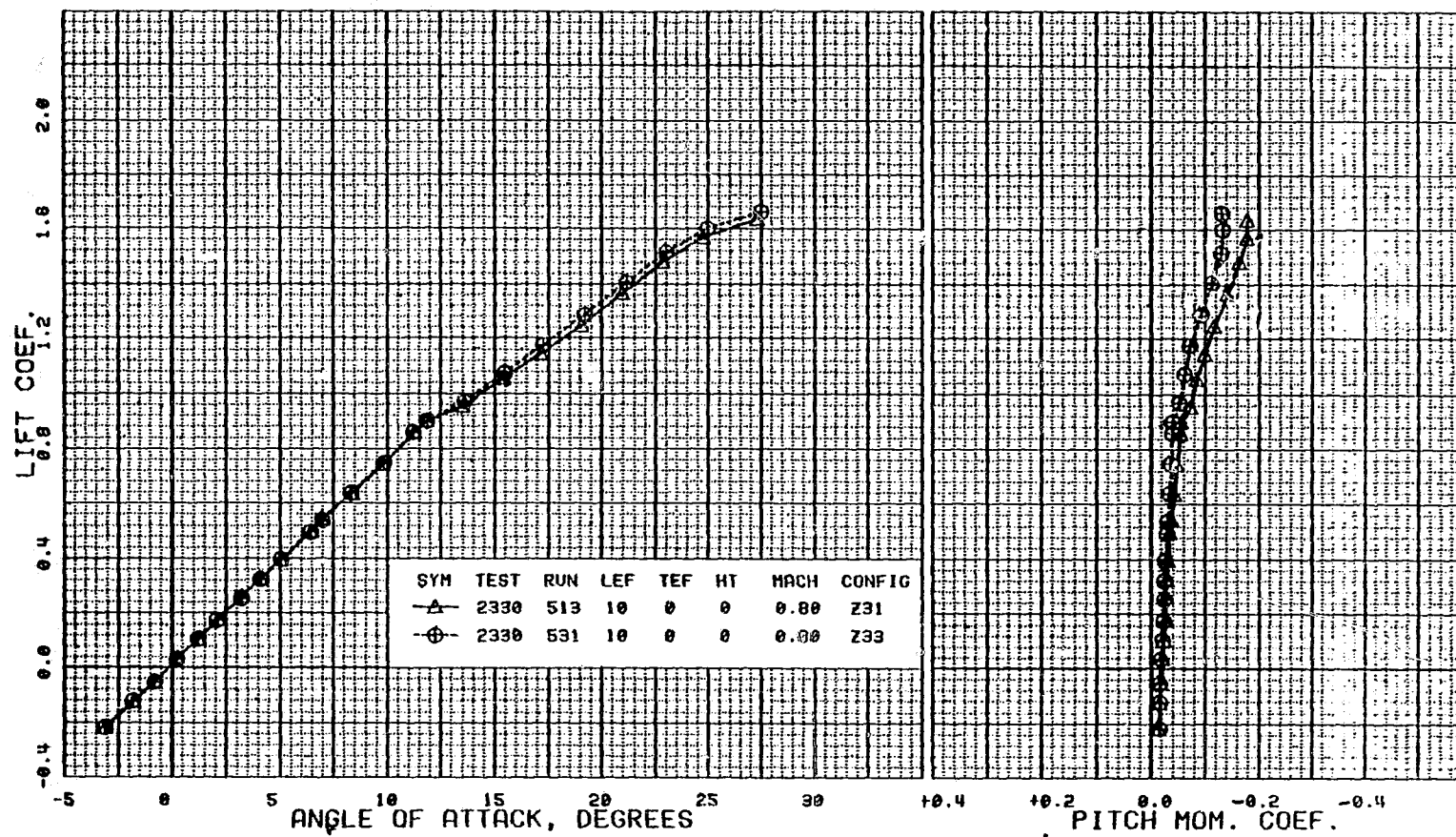


Figure 3-53 Effect of Forebody Strakes Z31 and Z33, Configuration 401-16, LEF = 10° , M = 0.80
(a) Lift and Pitching Moment

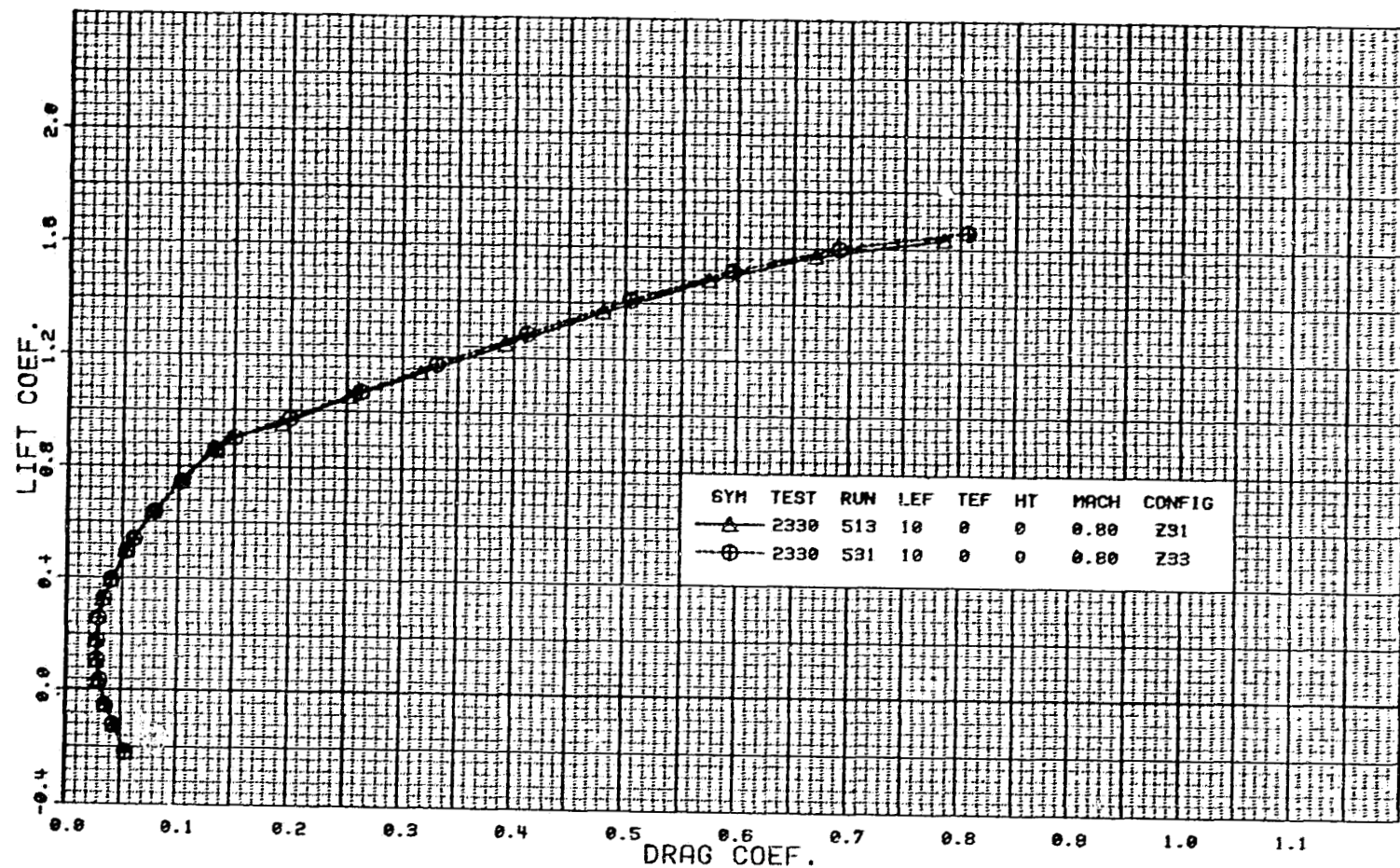


Figure 3-53 (b) Drag, Large Scale

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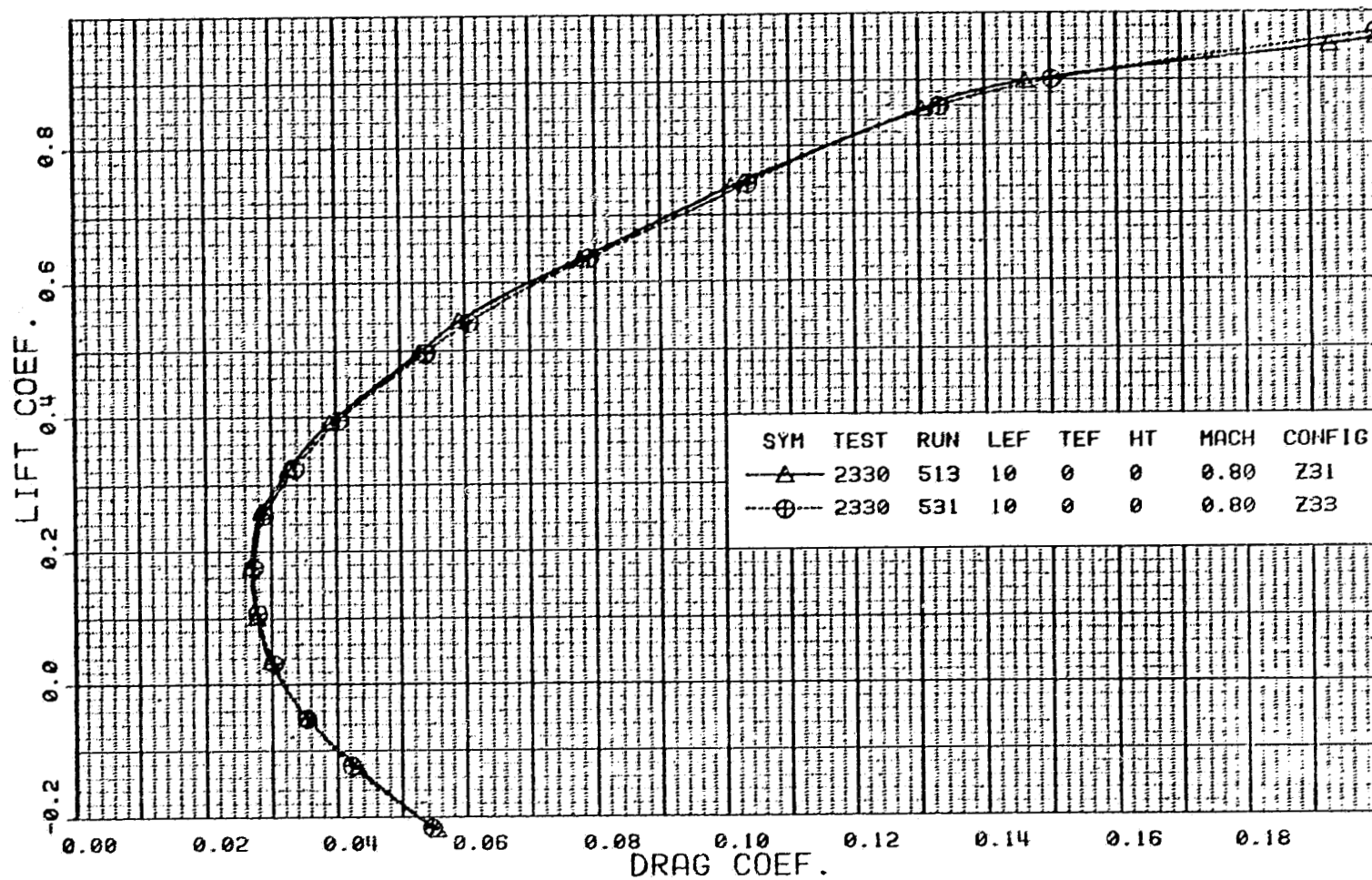


Figure 3-53 (c) Drag, Small Scale

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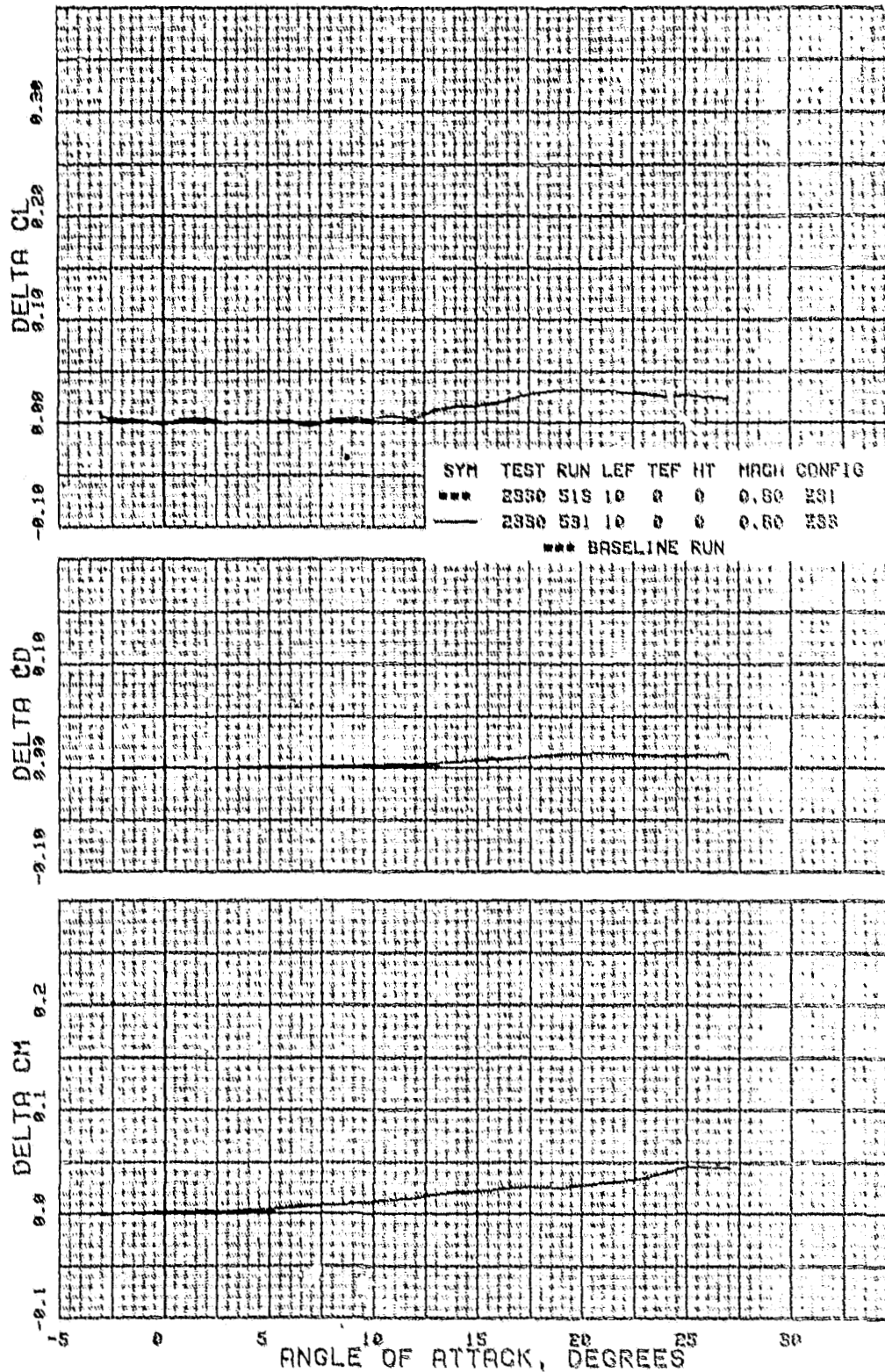


Figure 3-53 (d) Increments

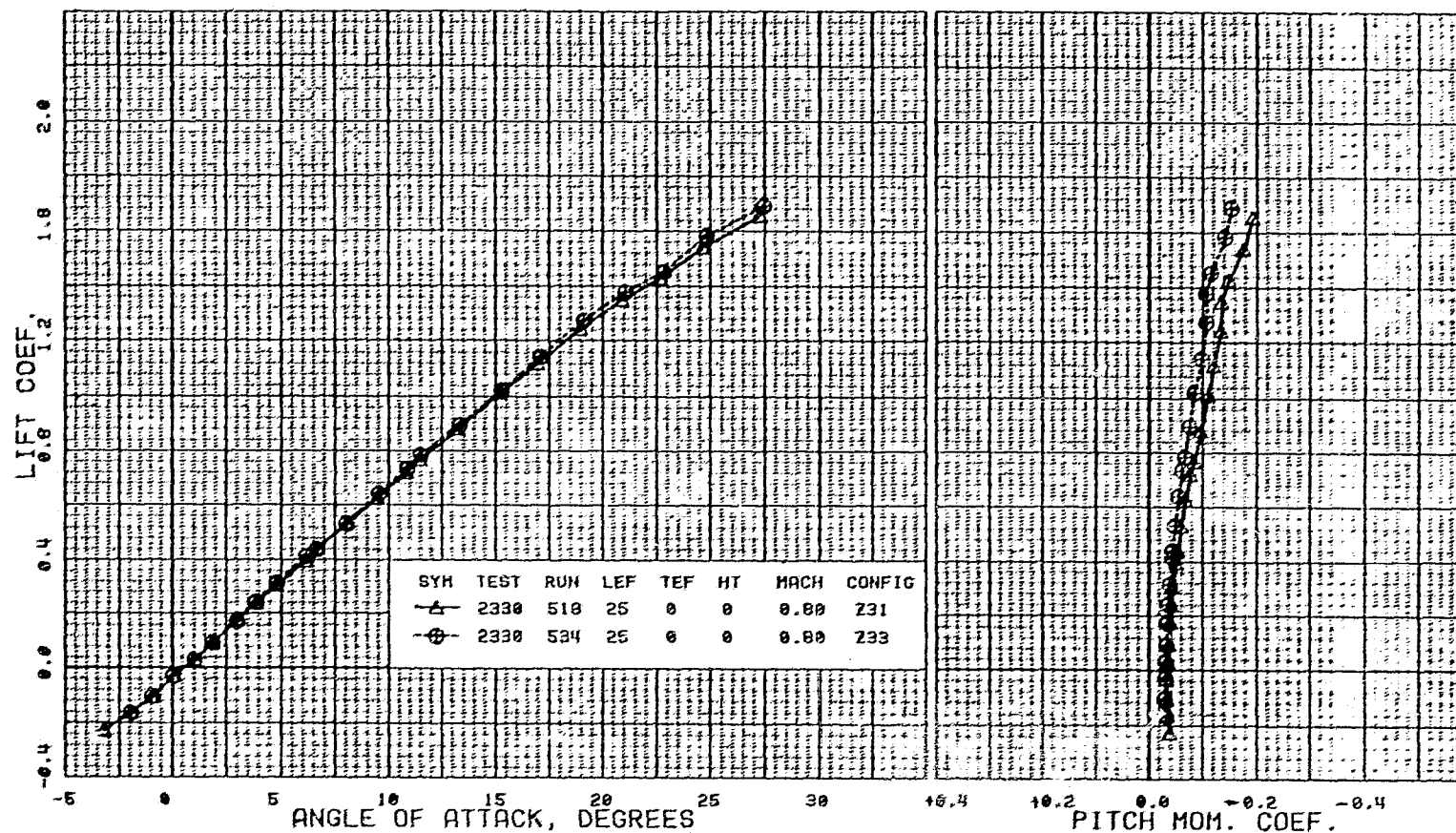
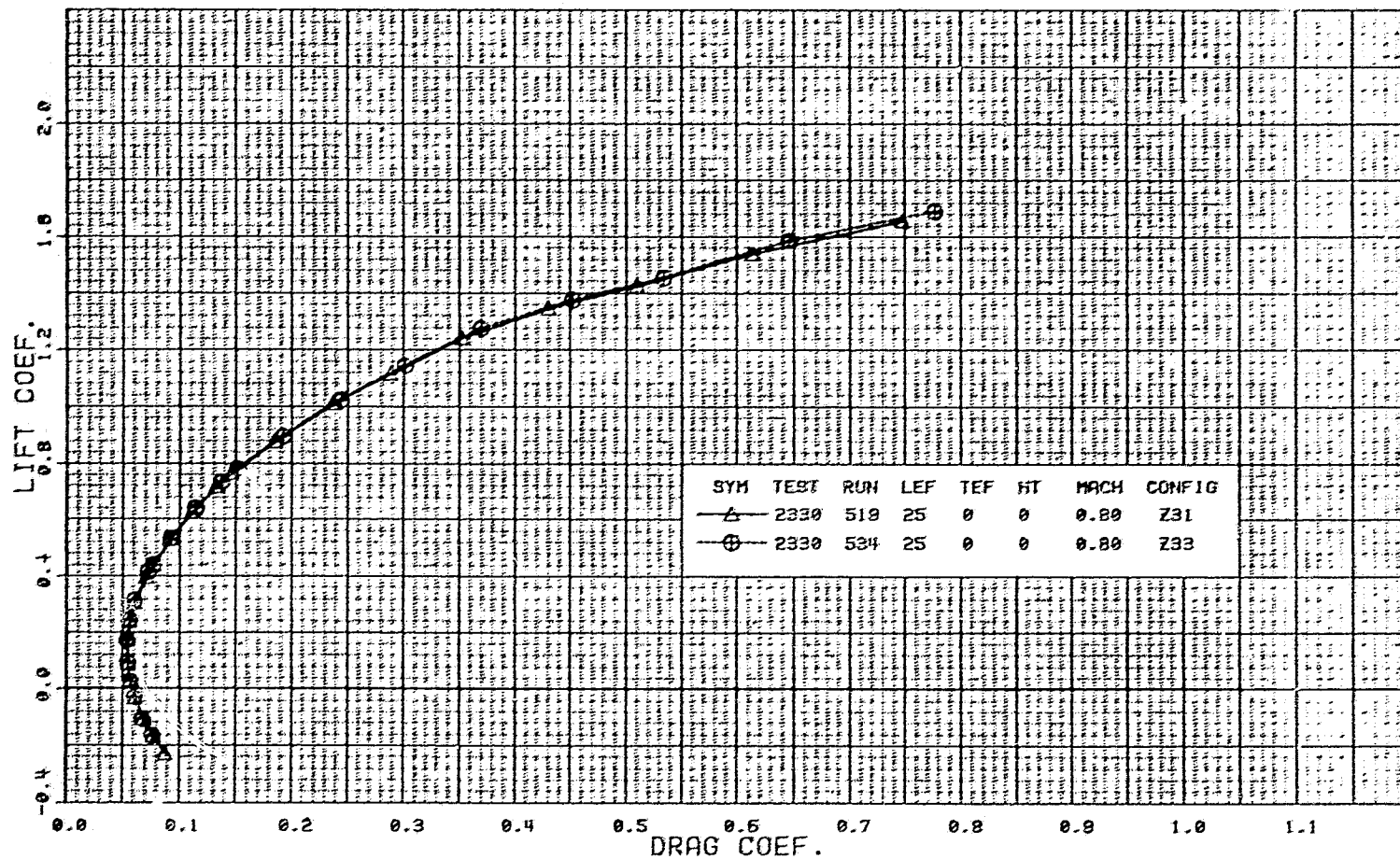


Figure 3-54 Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 25° , M = 0.80
(a) Lift and Pitching Moment



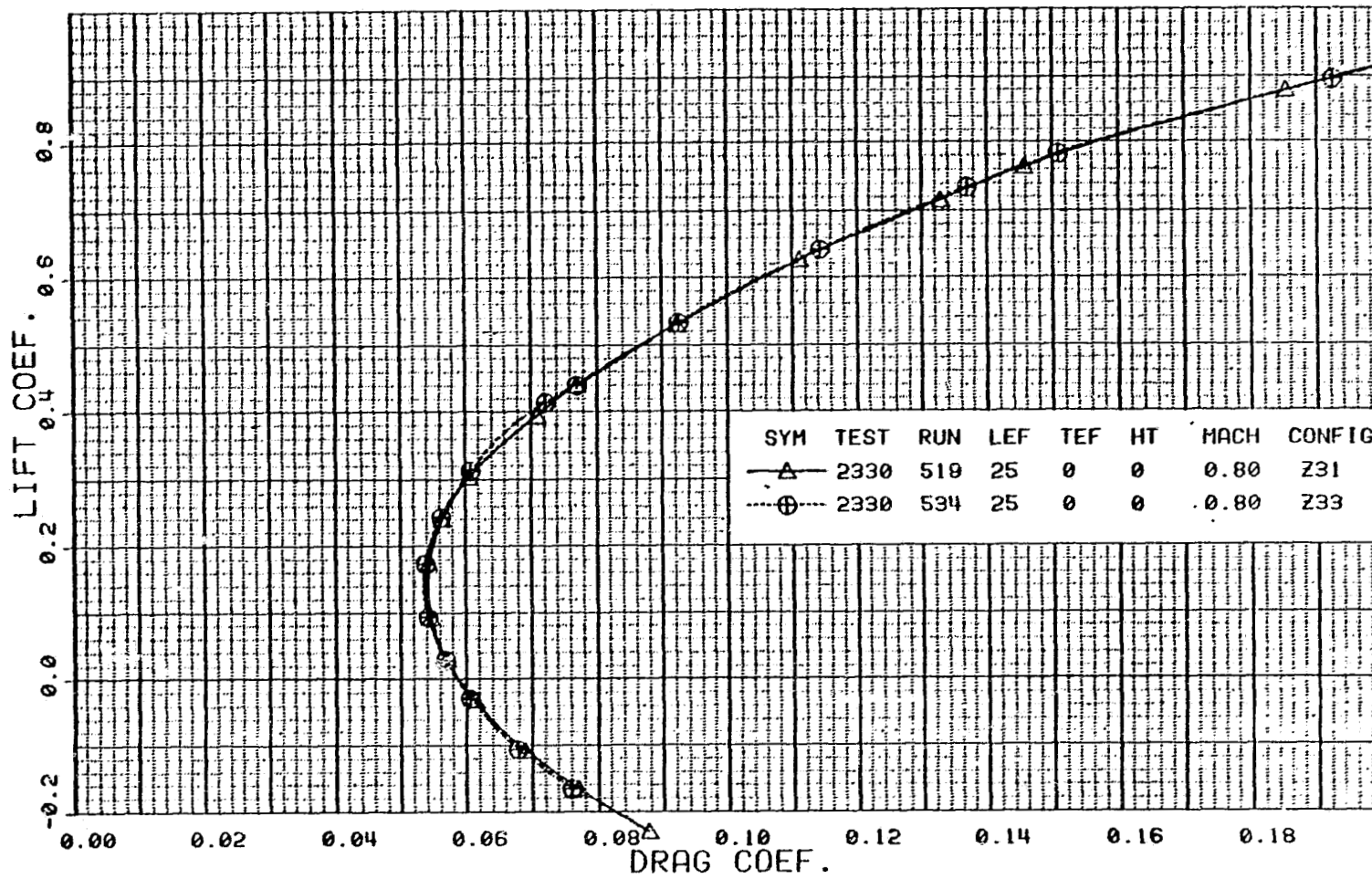


Figure 3-54 (c) Drag, Small Scale

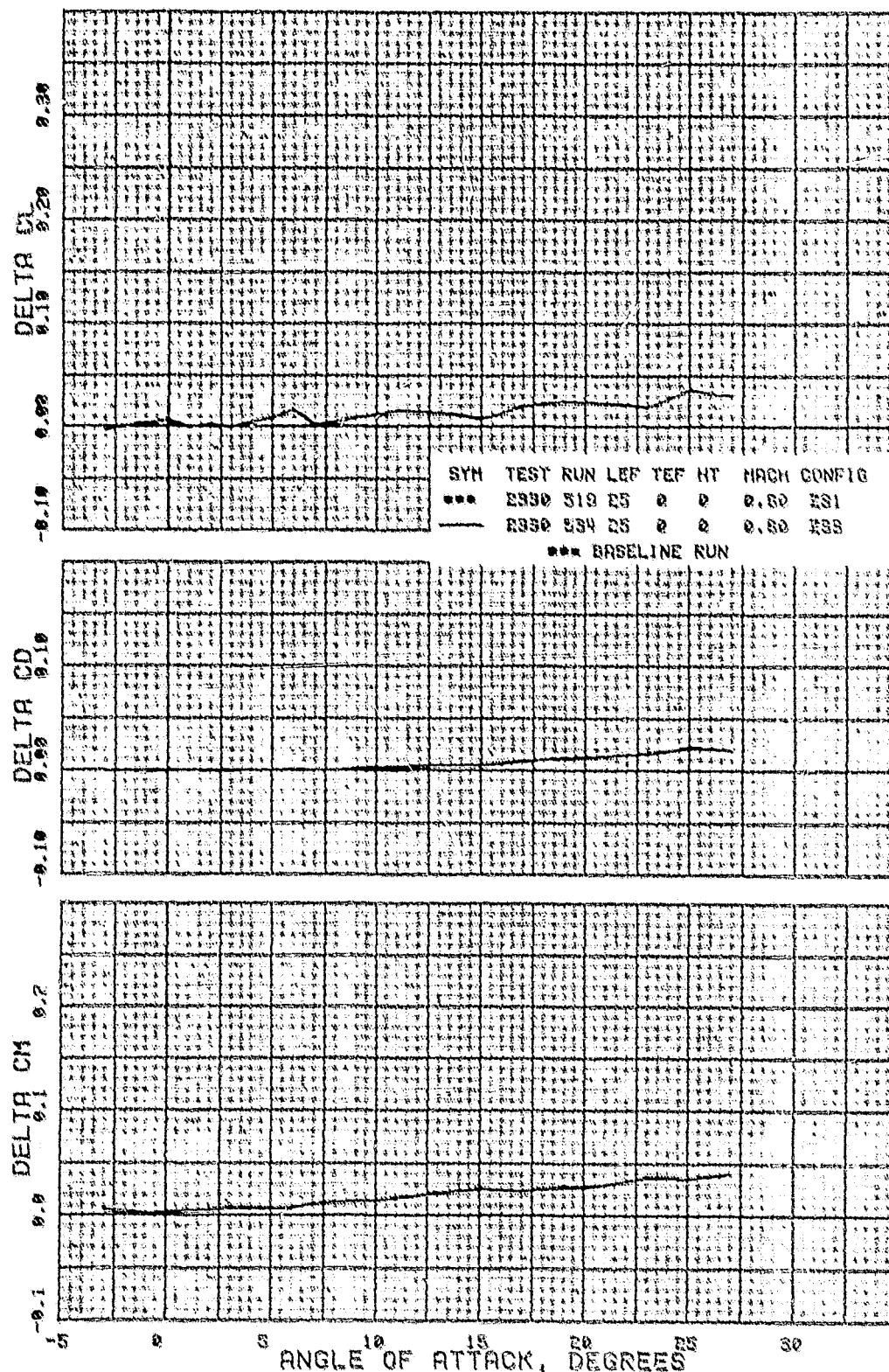


Figure 3-54 (d) Increments

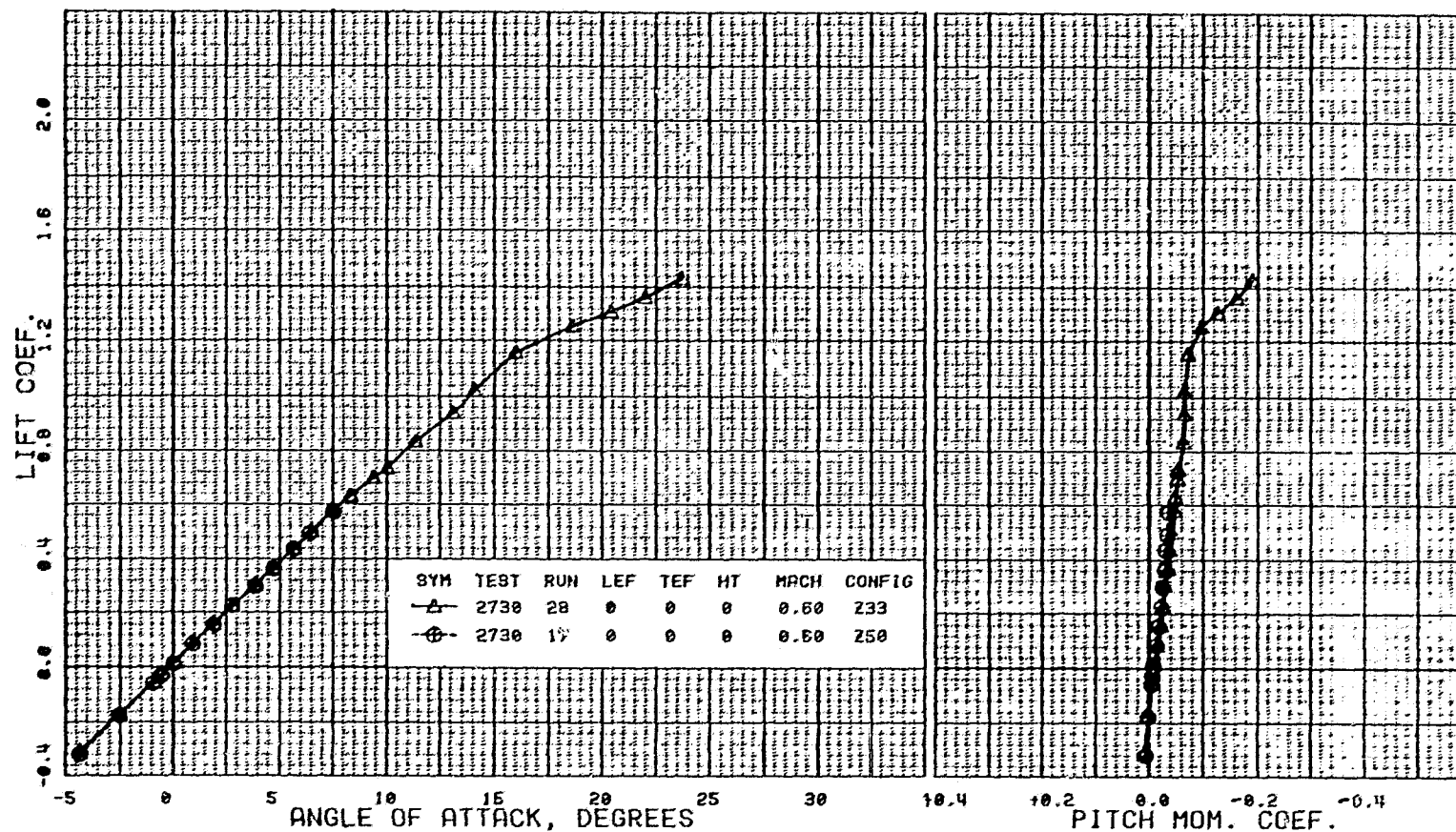


Figure 3-55 Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, $M = 0.60$
(a) Lift and Pitching Moment

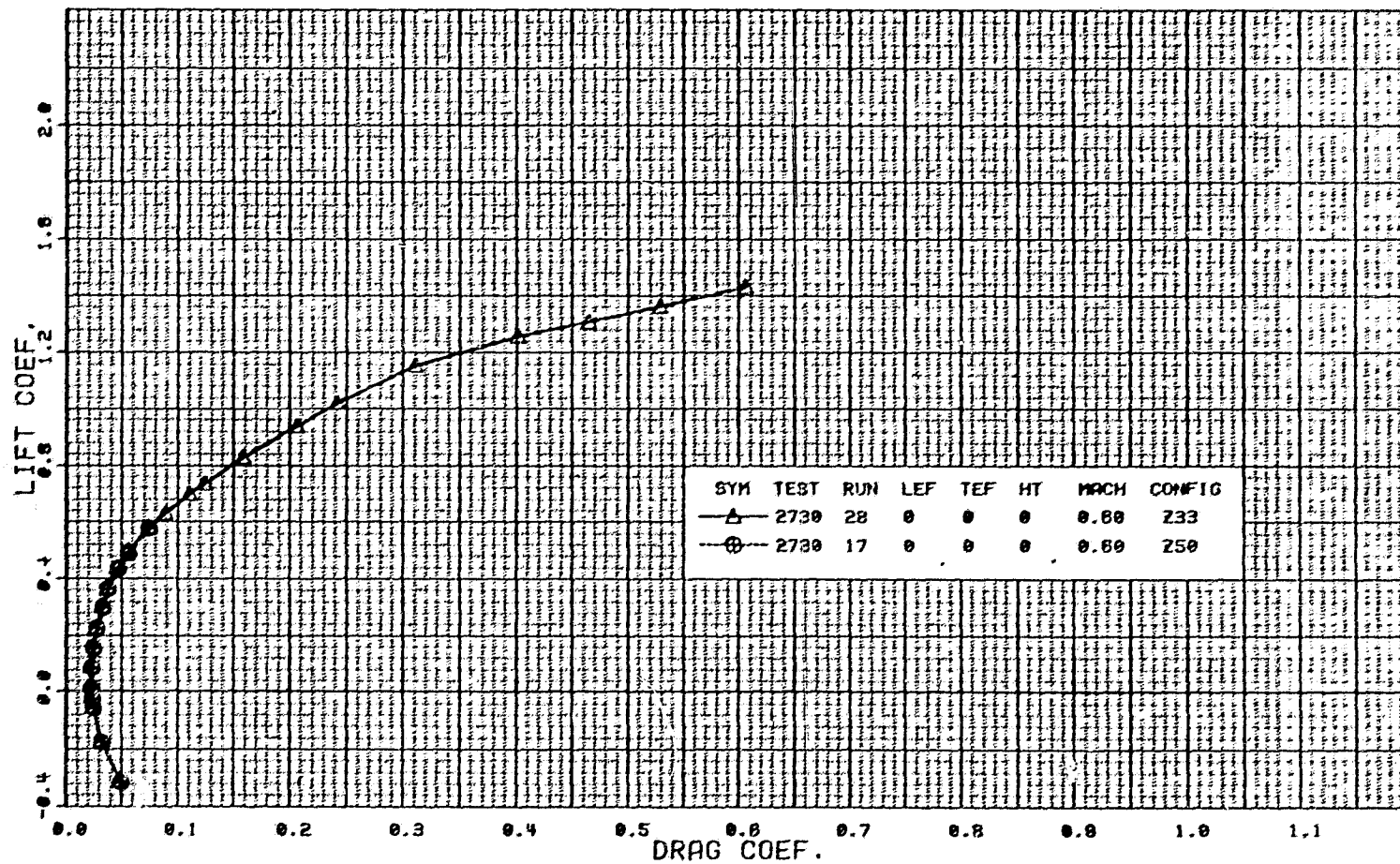


Figure 3-55 (b) Drag, Large Scale

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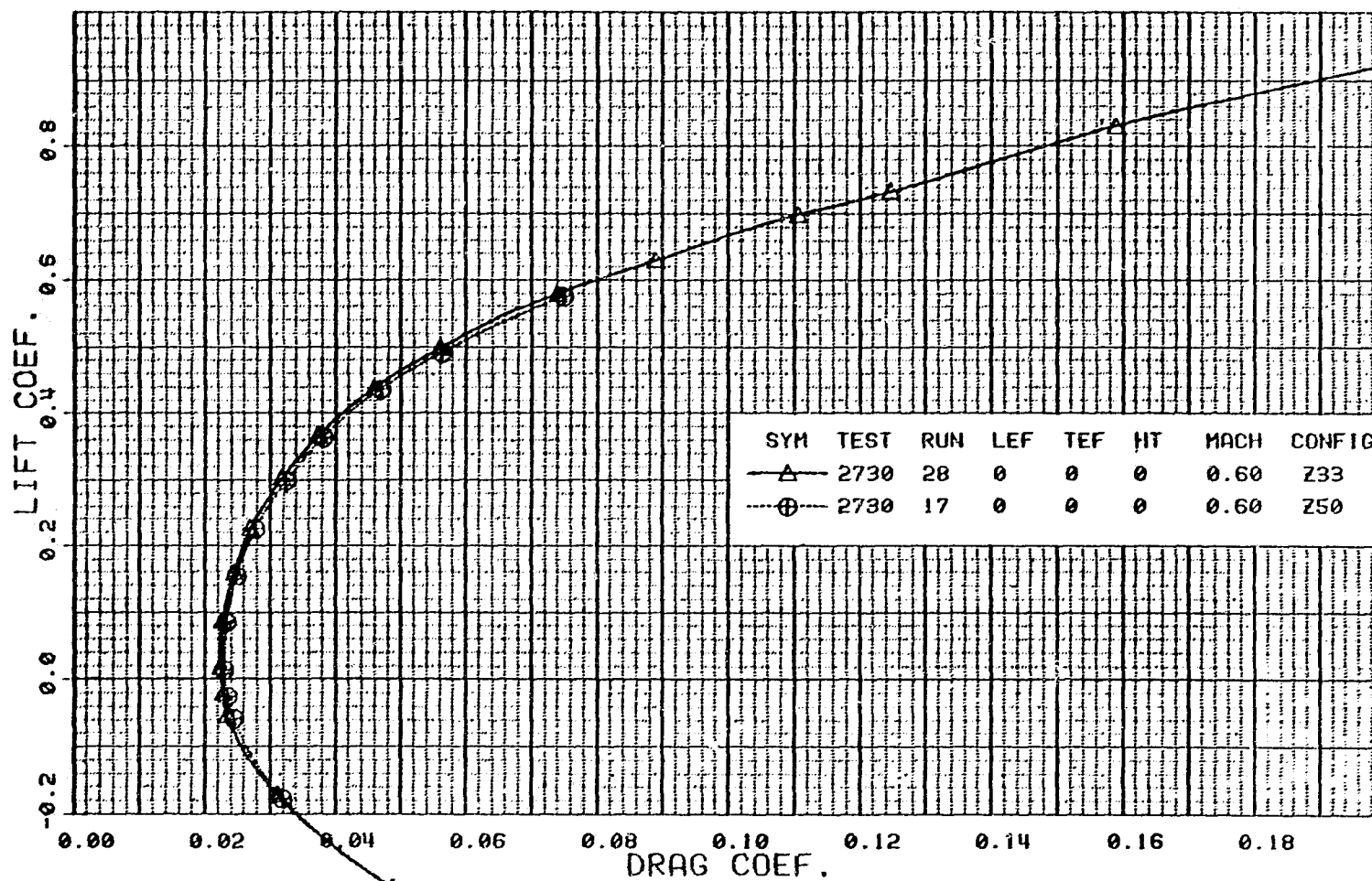


Figure 3-55 (c) Drag, Small Scale

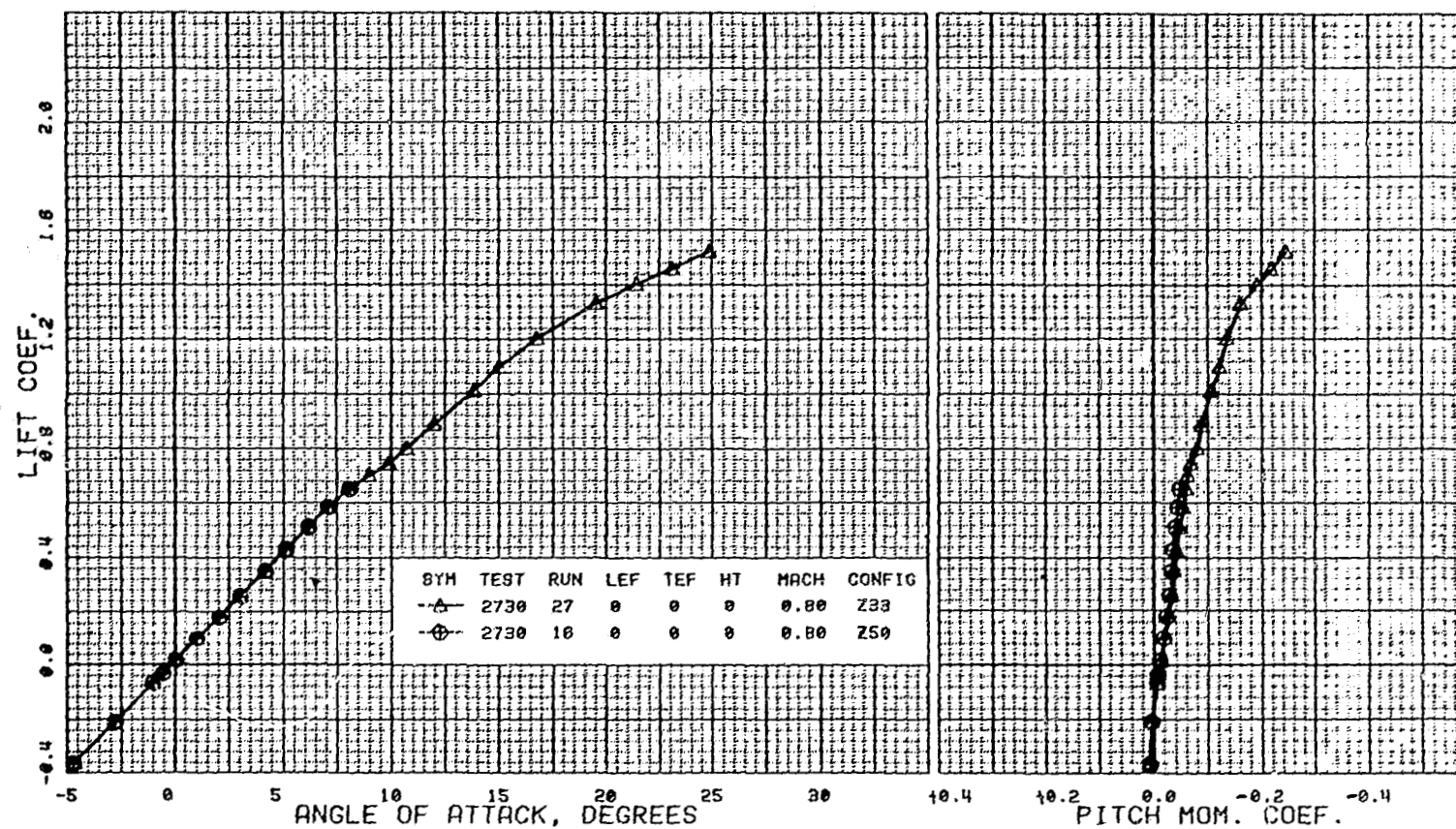


Figure 3-56 Effect of Forebody Strakes Z33 and Z50, Configuration
401F-16E, LEF = 0, M = 0.80
(a) Lift and Pitching Moment

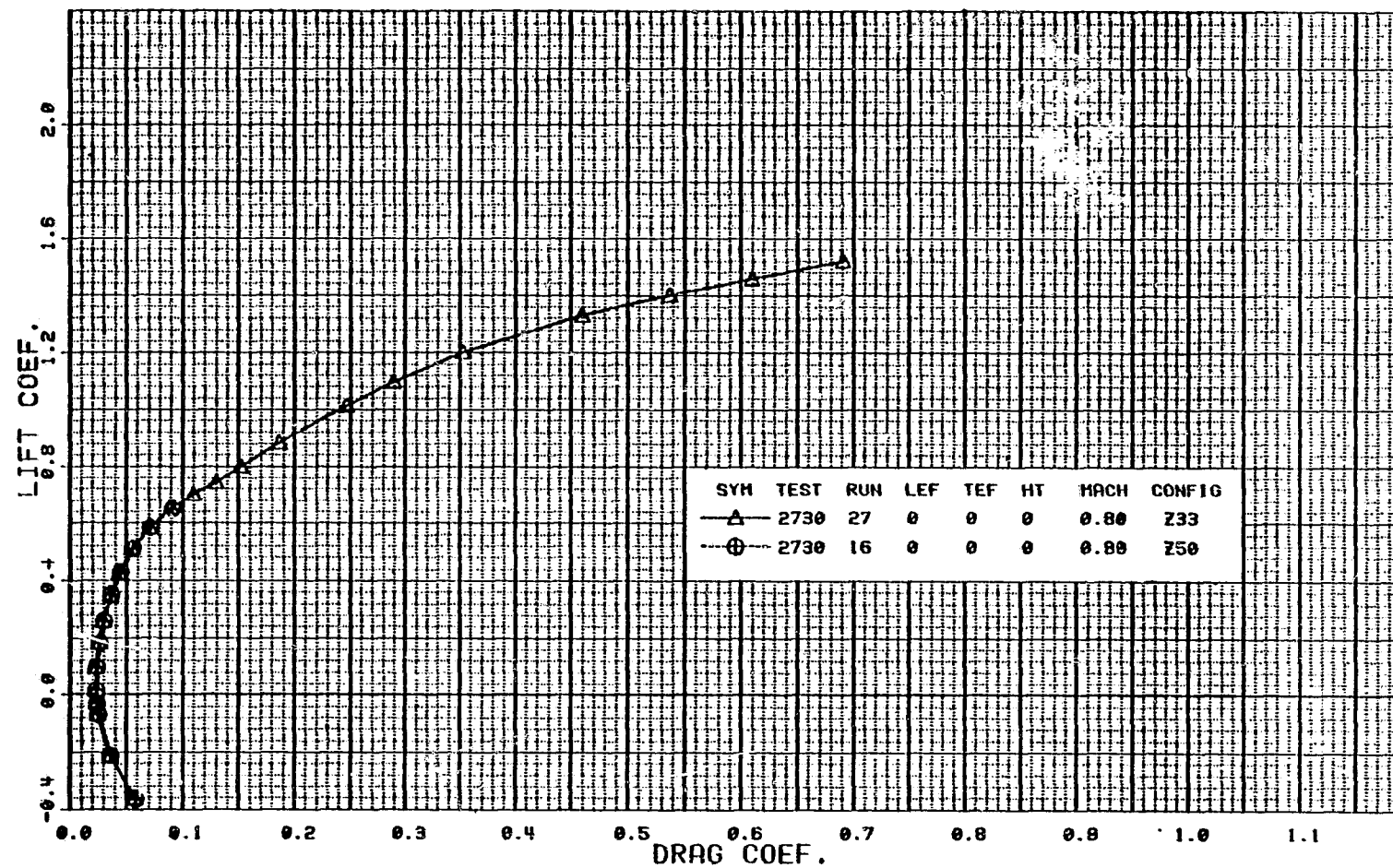


Figure 3-56 (b) Drag, Large Scale

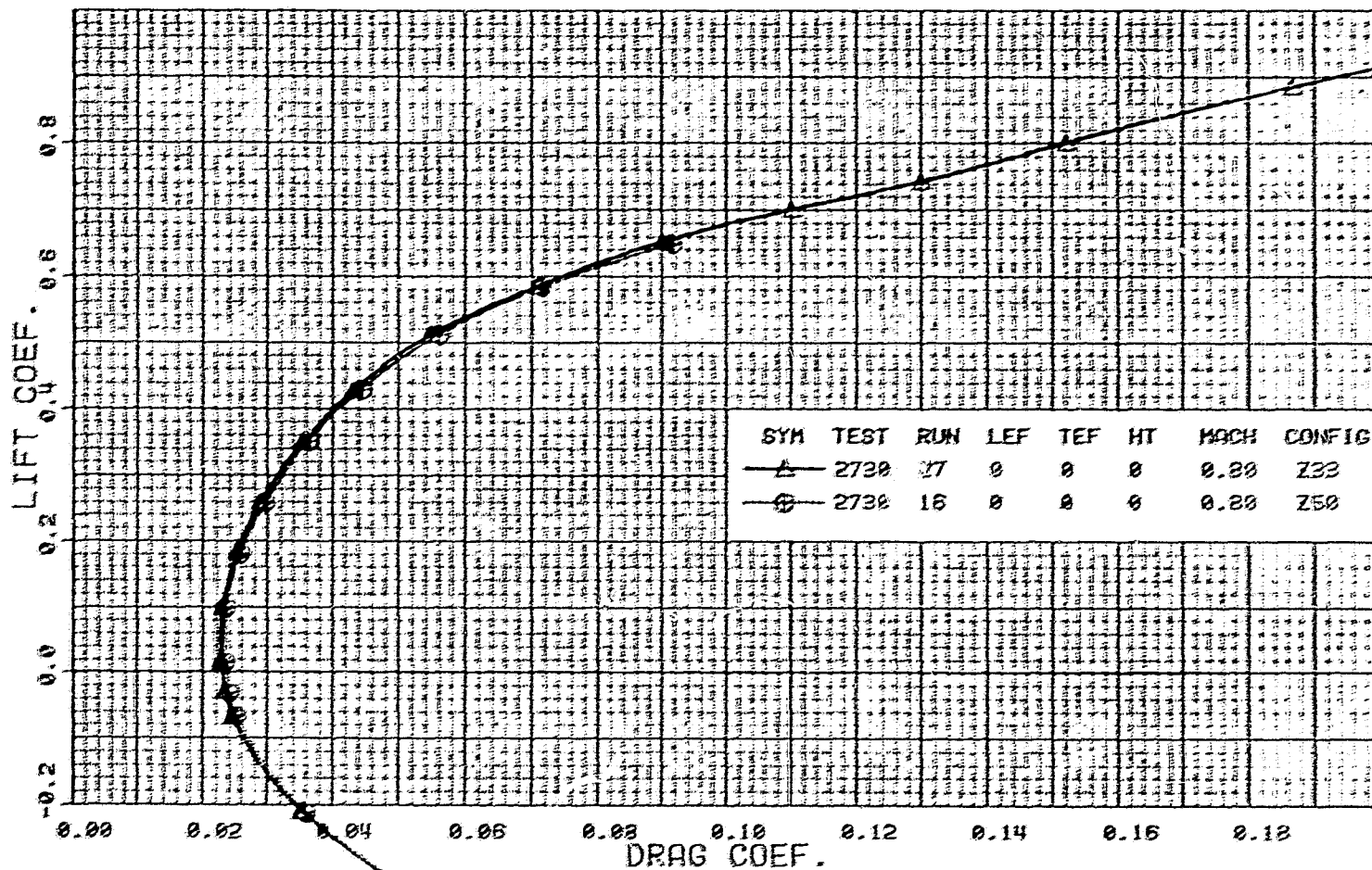


Figure 3-56 (c) Drag, Small Scale

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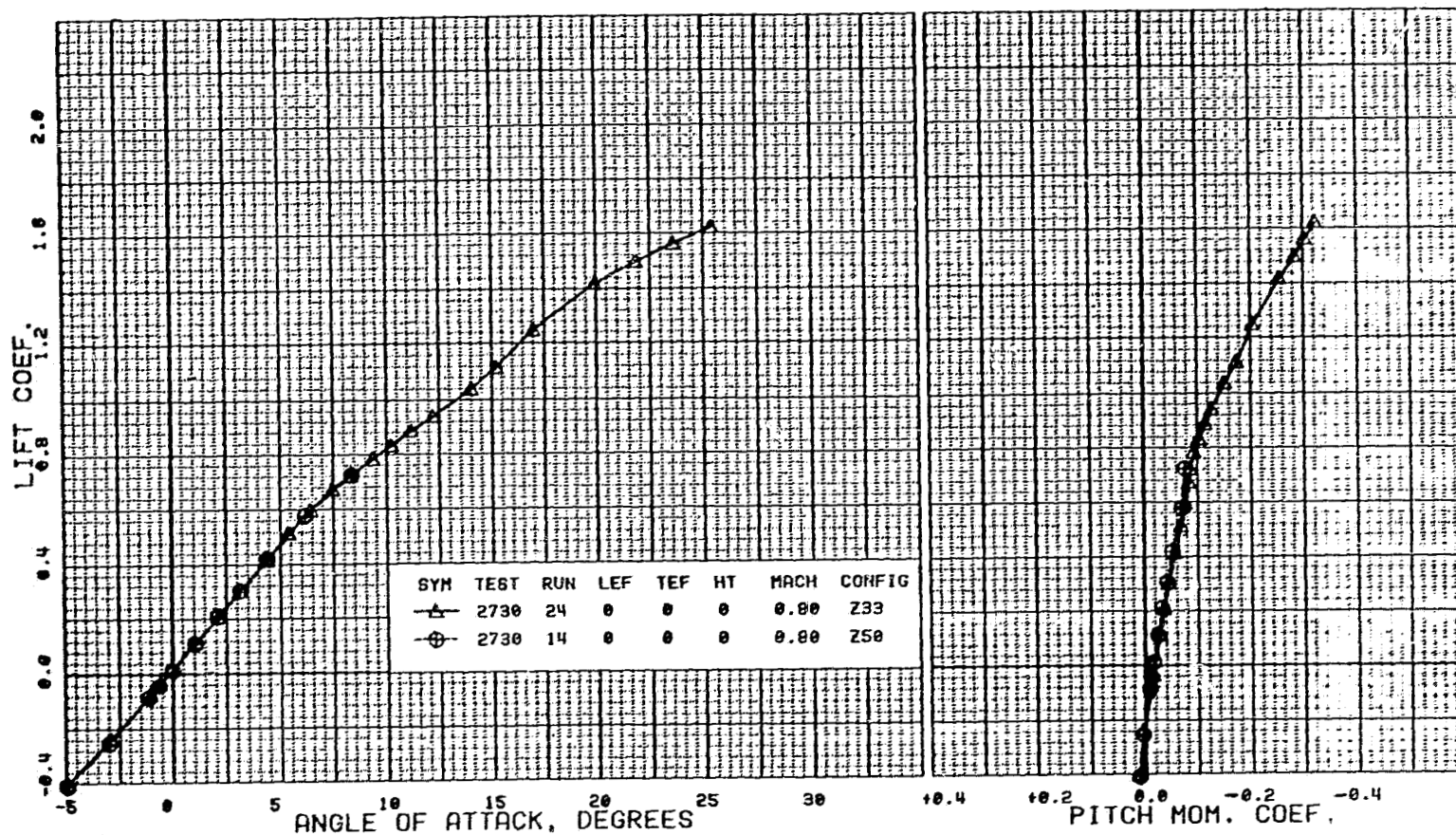


Figure 3-57 Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, $M = 0.90$
(a) Lift and Pitching Moment

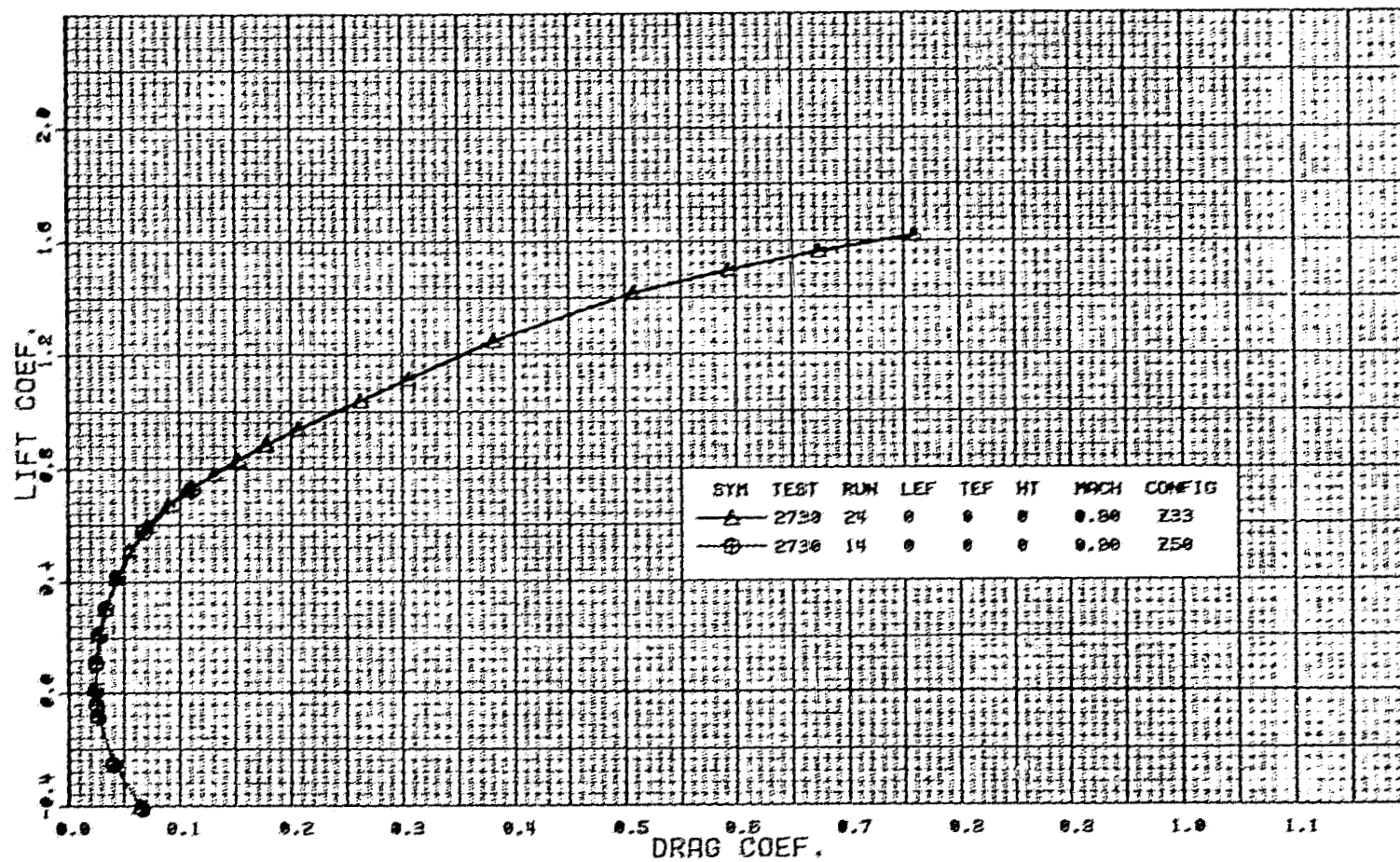


Figure 3-57 (b) Drag, Large Scale

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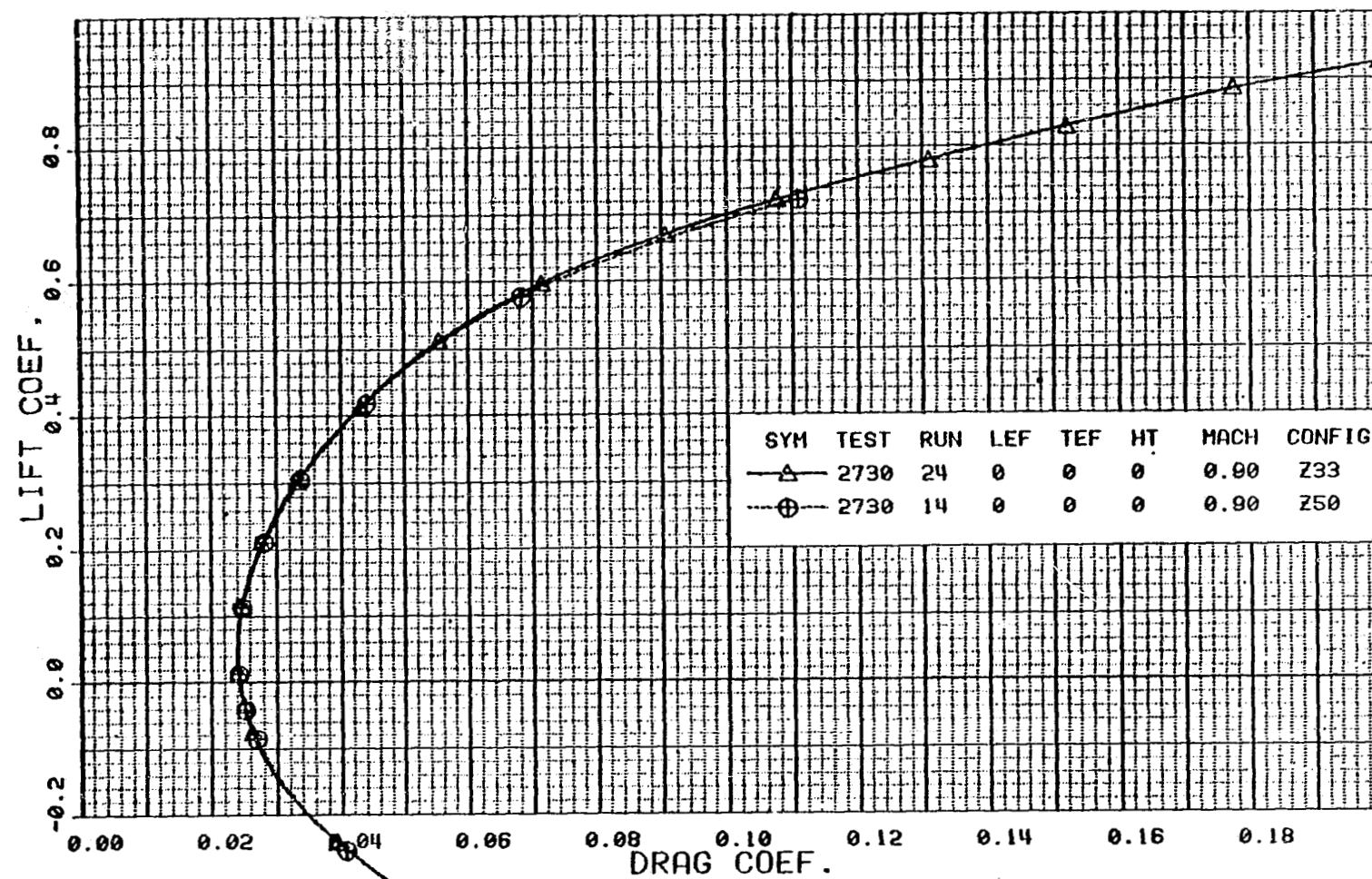


Figure 3-57 (c) Drag, Small Scale

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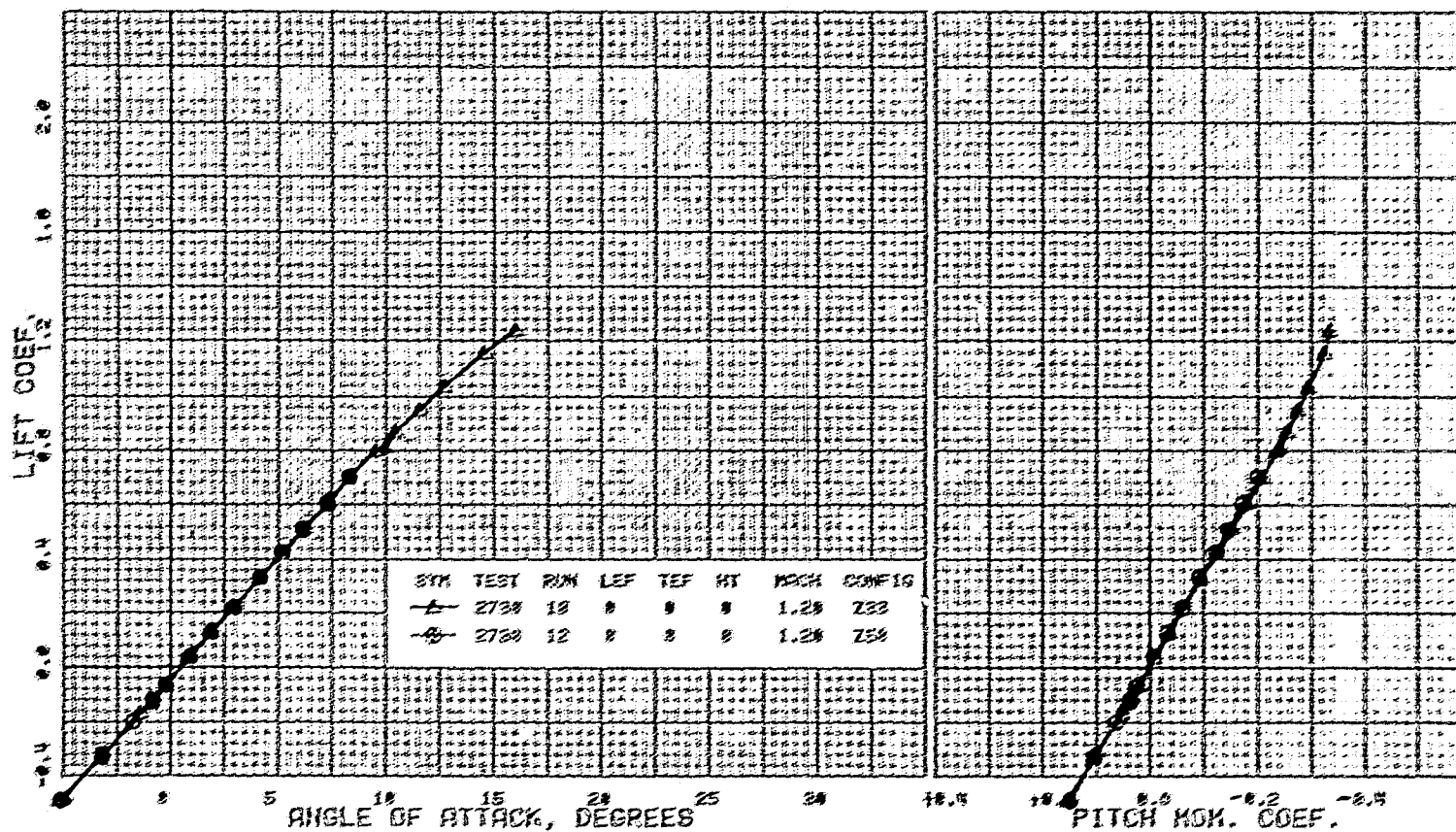


Figure 3-58 Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, $M = 1.20$
(a) Lift and Pitching Moment

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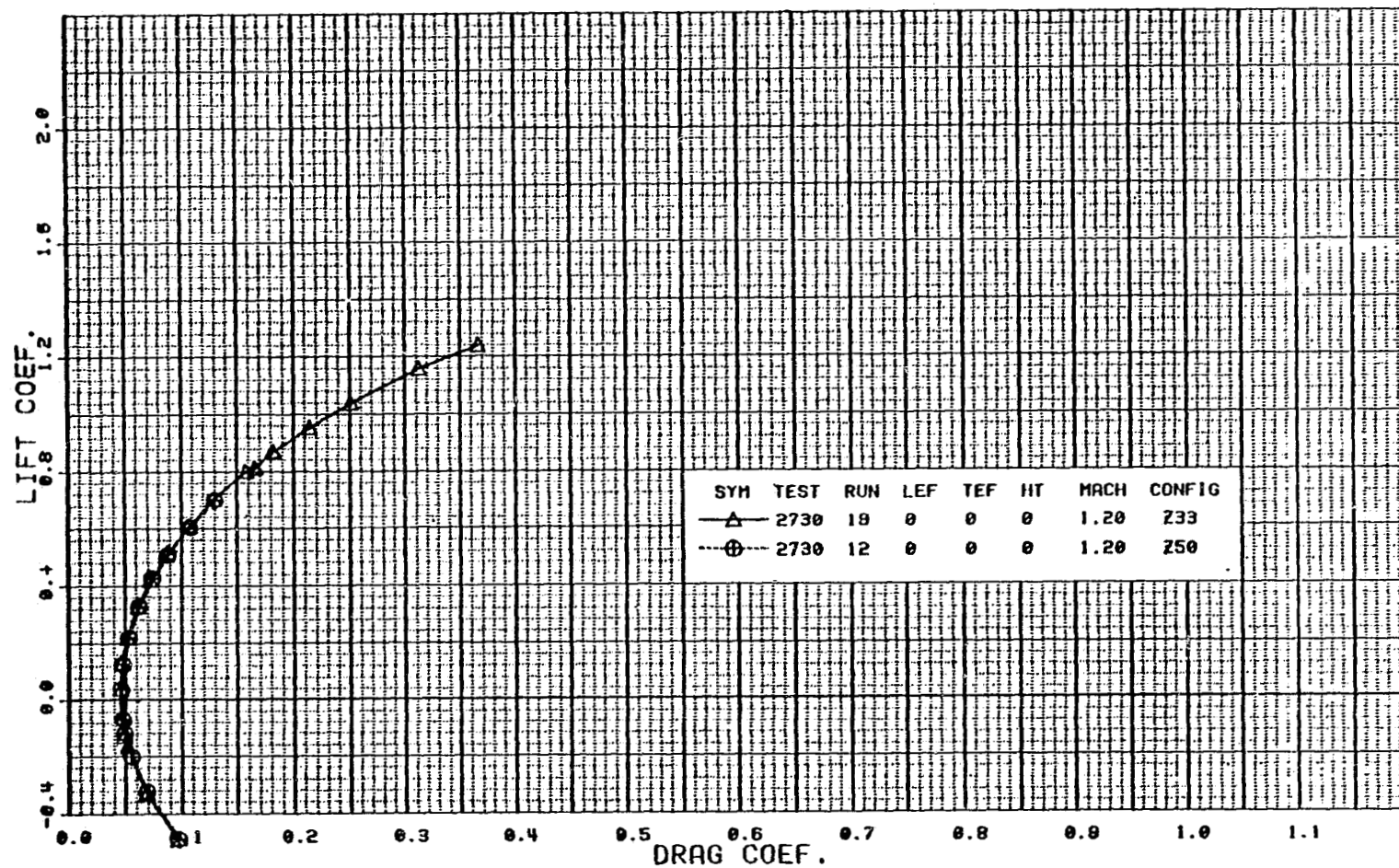


Figure 3-58 (b) Drag, Large Scale

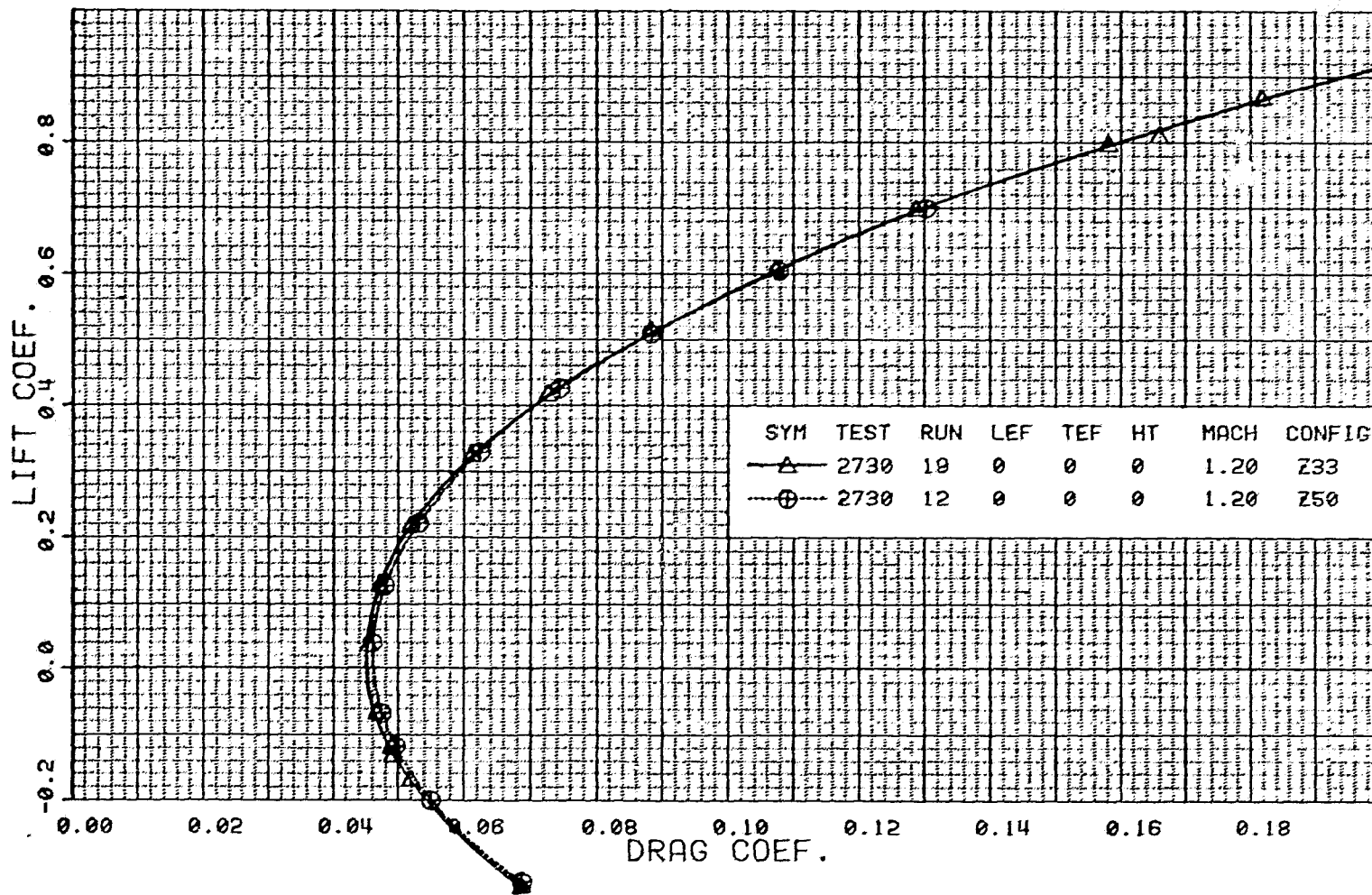


Figure 3-58 (c) Drag, Small Scale

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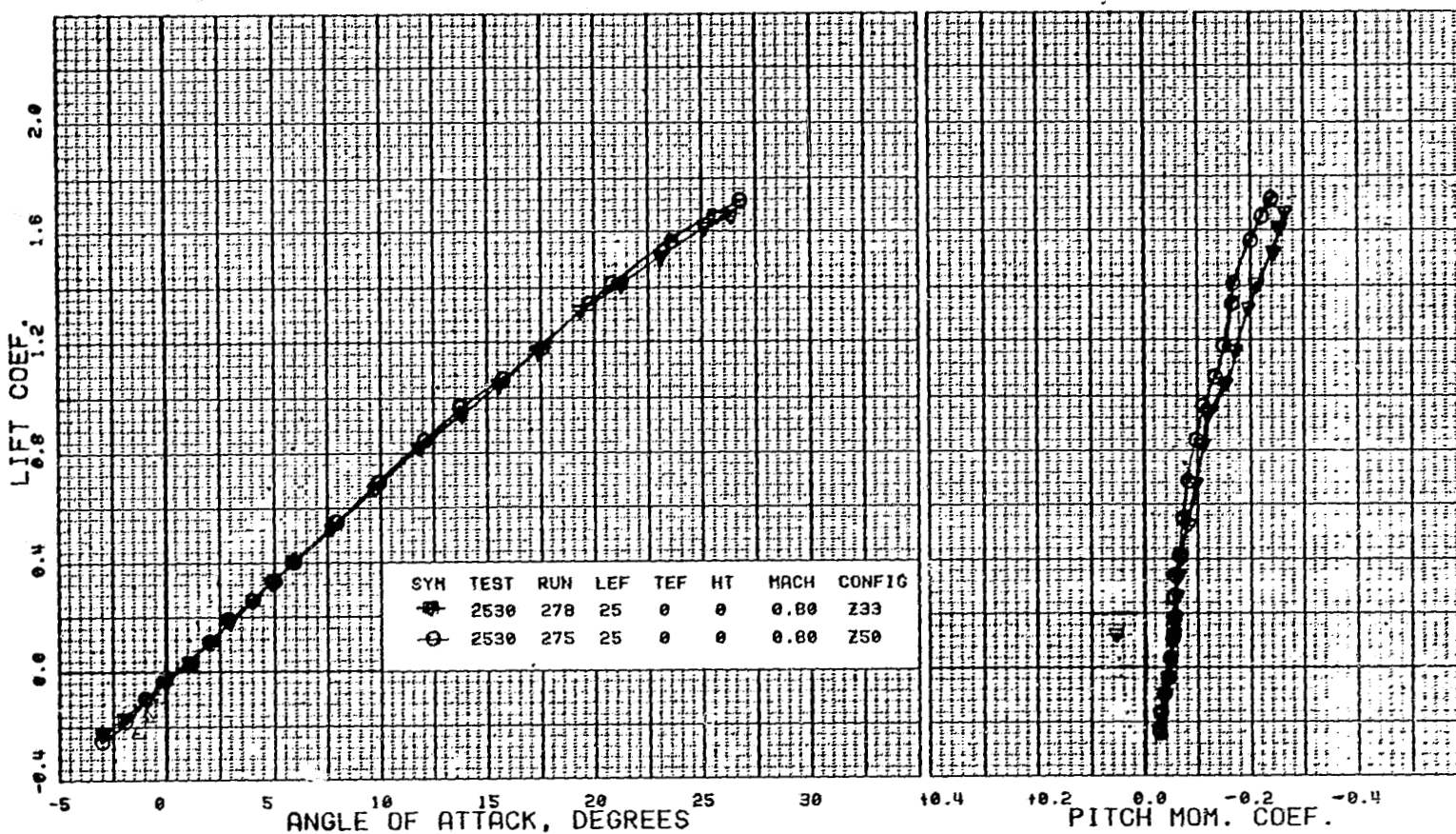


Figure 3-59 Effect of Forebody Strakes Z33 and Z50, Configuration 401F-16E, LEF = 25°, M = 0.80
(a) Lift and Pitching Moment

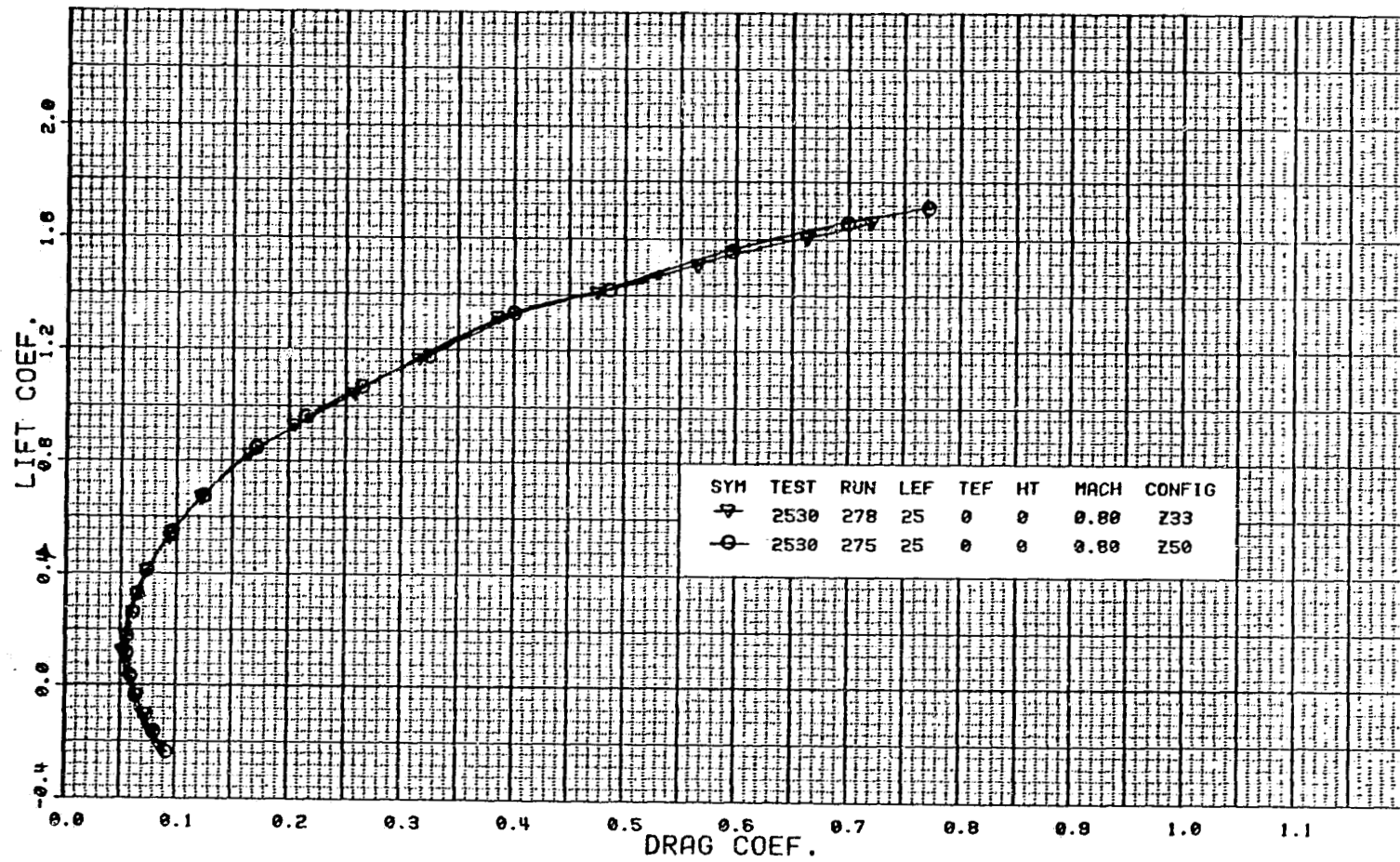


Figure 3-59 (b) Drag, Large Scale

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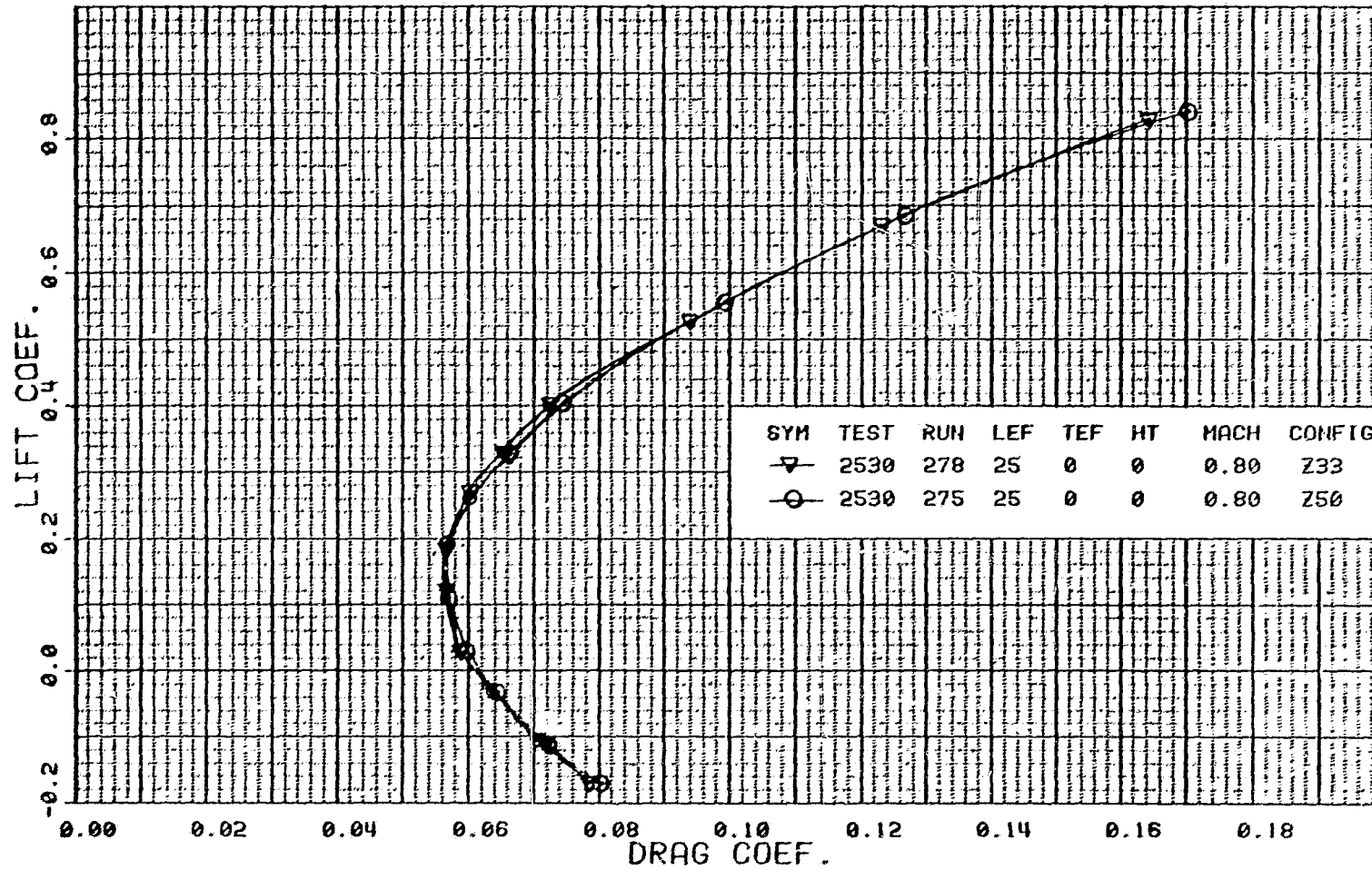


Figure 3-59 (c) Drag, Small Scale

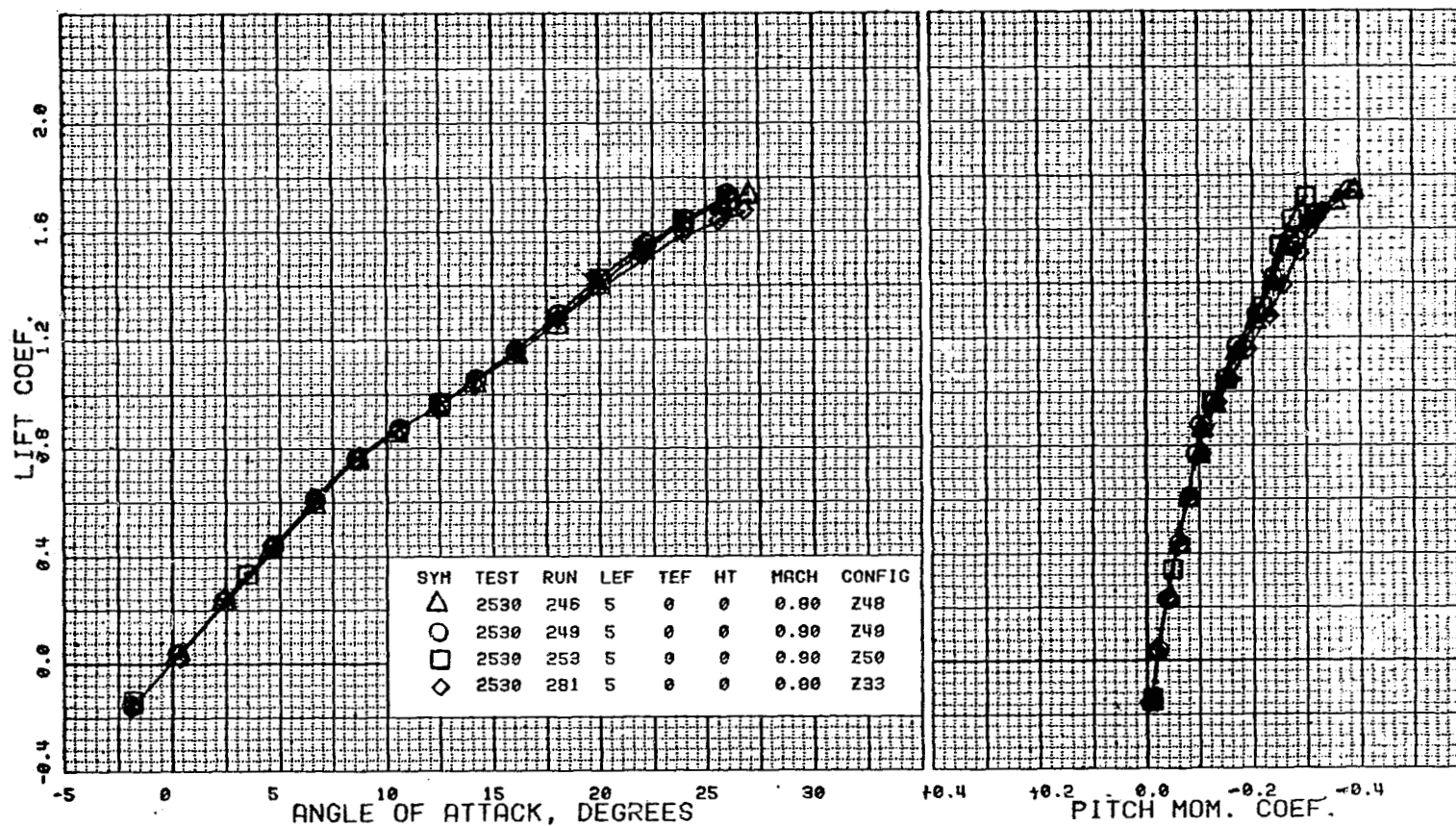


Figure 3-60 Effect of Forebody Strake Shape (Z33,Z48,-Z50), Configuration 401F-16E, $M = 0.90$
 (a) Lift and Pitching Moment

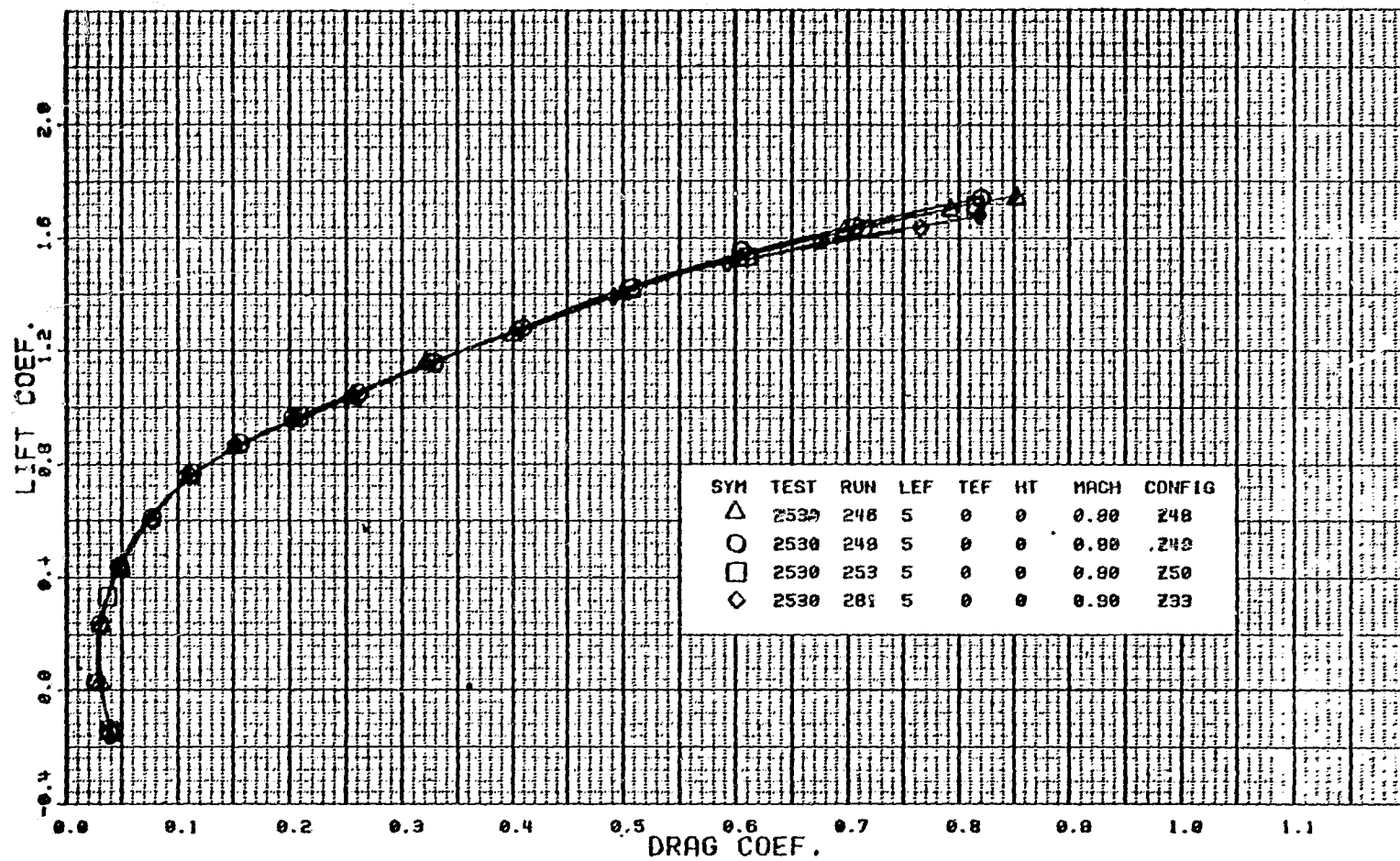


Figure 3-60 (b) Drag, Large Scale

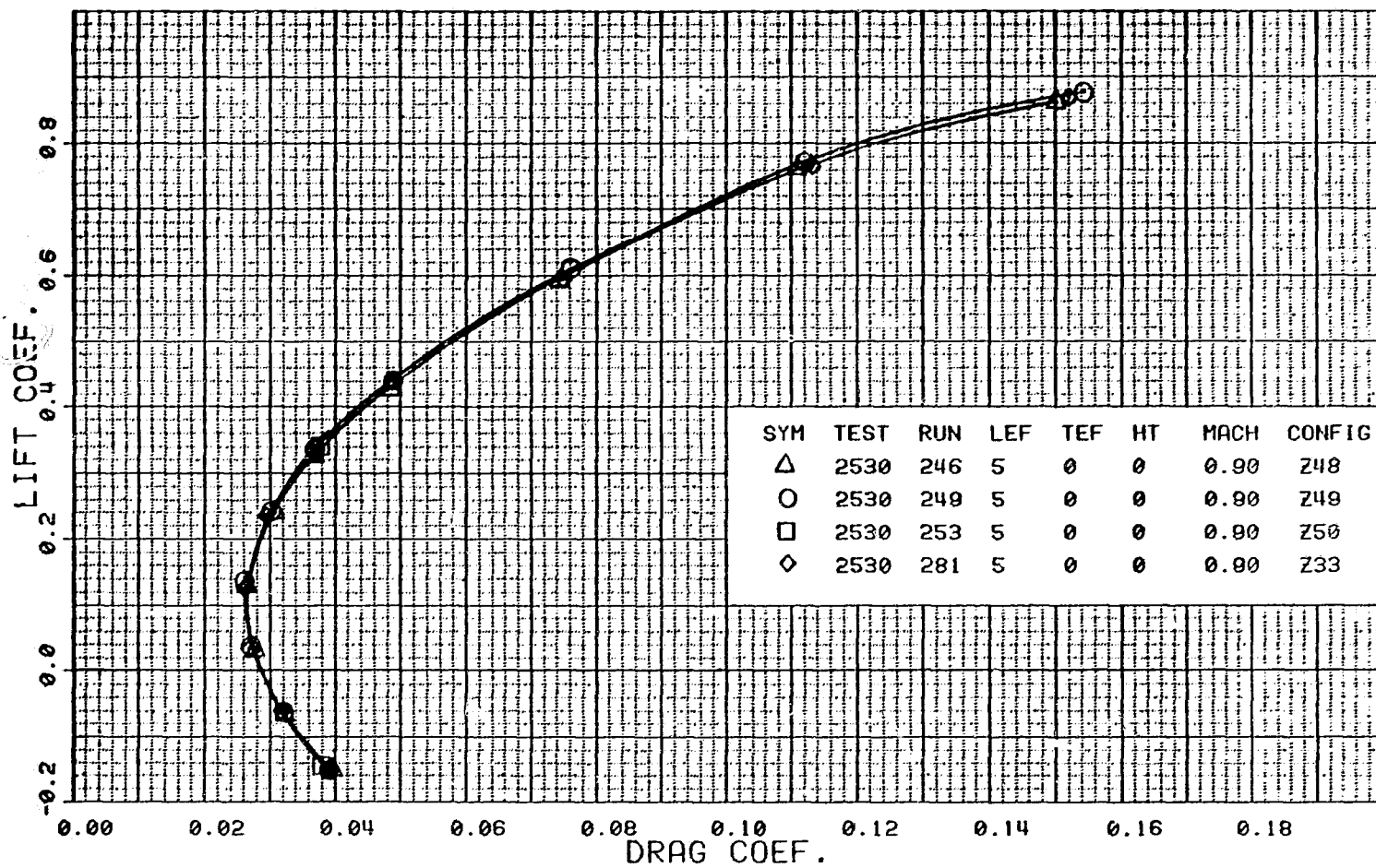


Figure 3-60 (c) Drag, Small Scale

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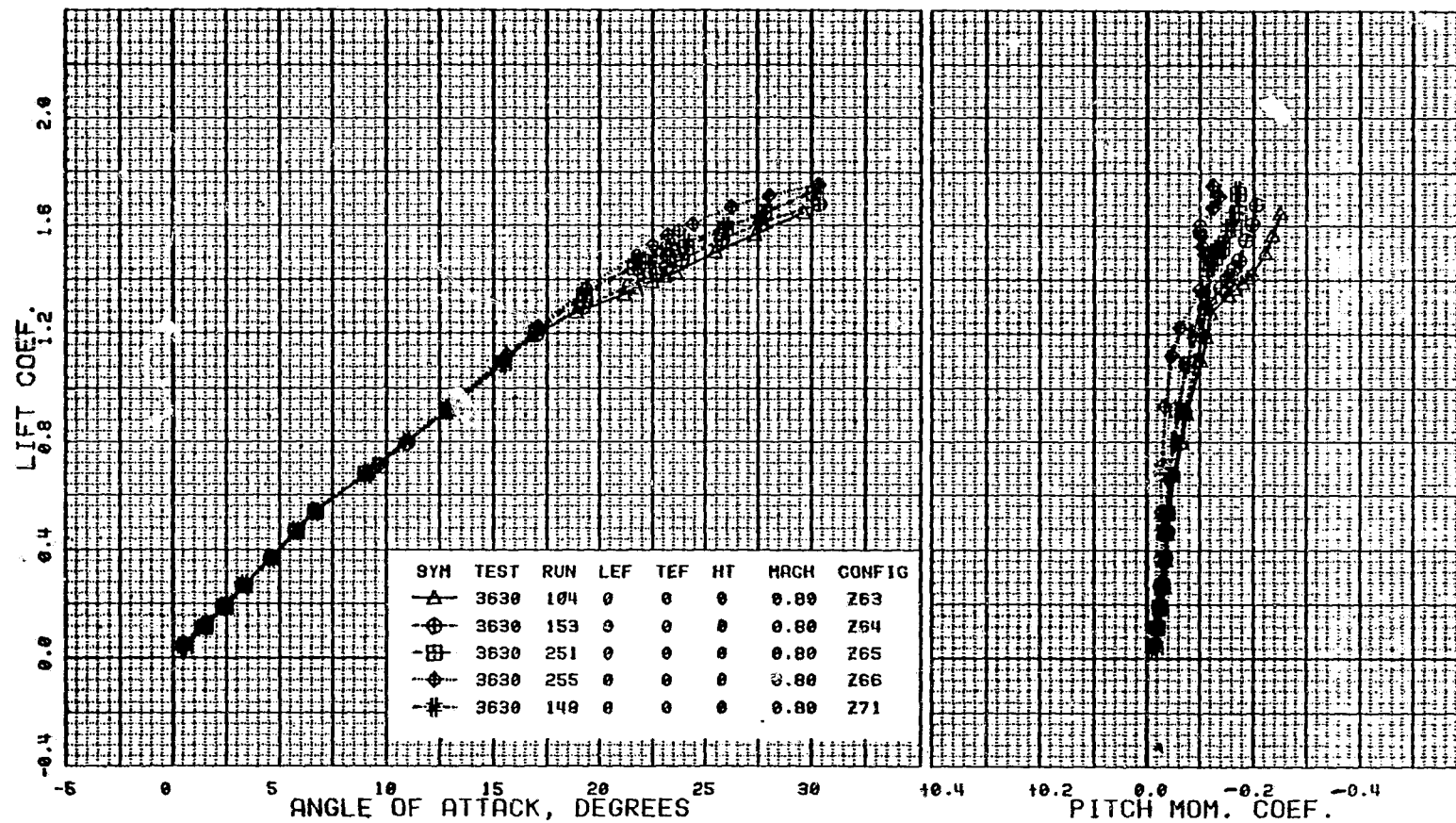


Figure 3-61 Effect of Forebody Strake Shape (Z63-Z66,Z71), YF-16+30.5
Stretch, M = 0.80
(a) Lift and Pitching Moment

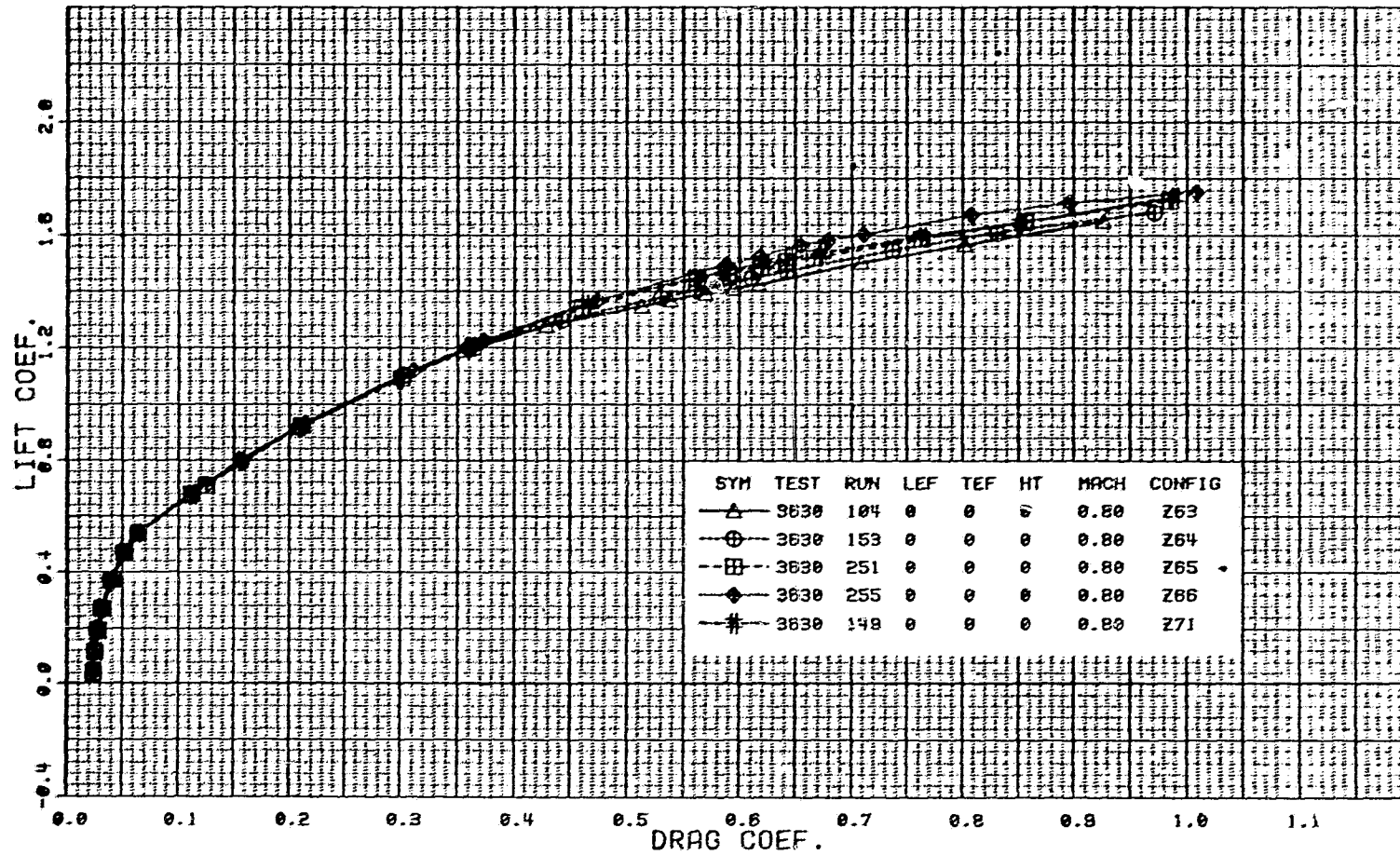


Figure 3-61 (b) Drag, Large Scale

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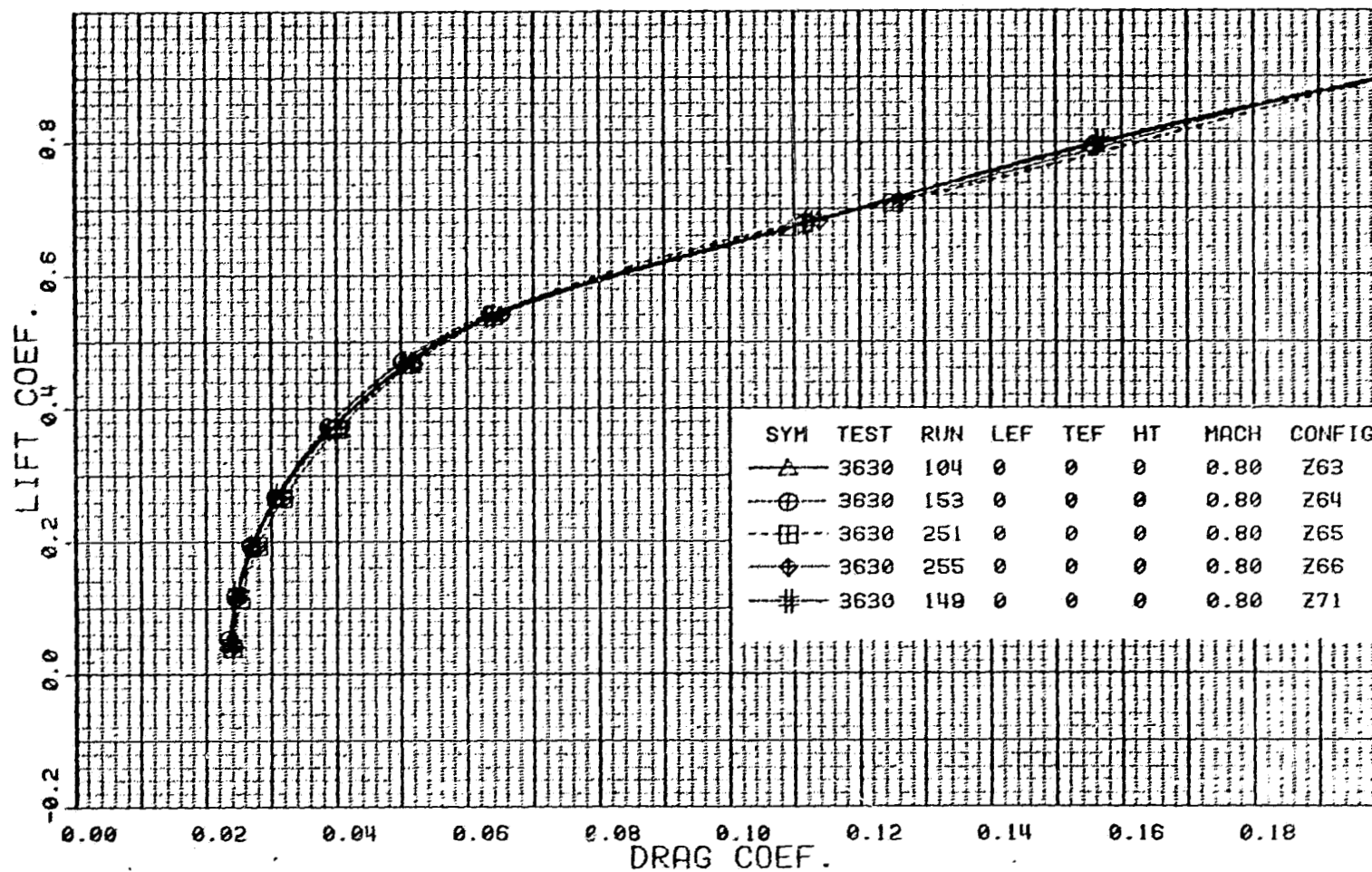


Figure 3-61 (c) Drag, Small Scale

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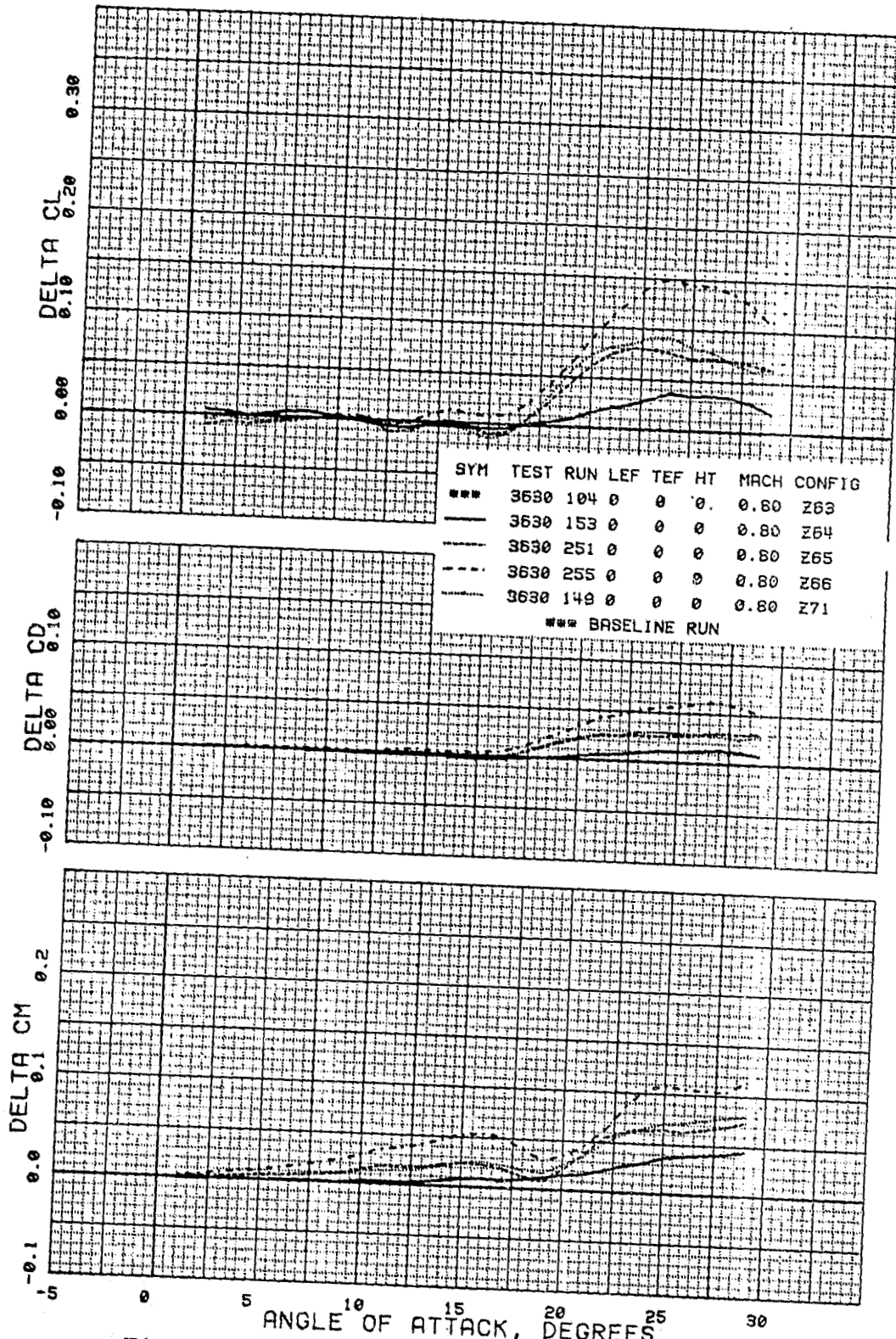


Figure 3-61 (d) Increments

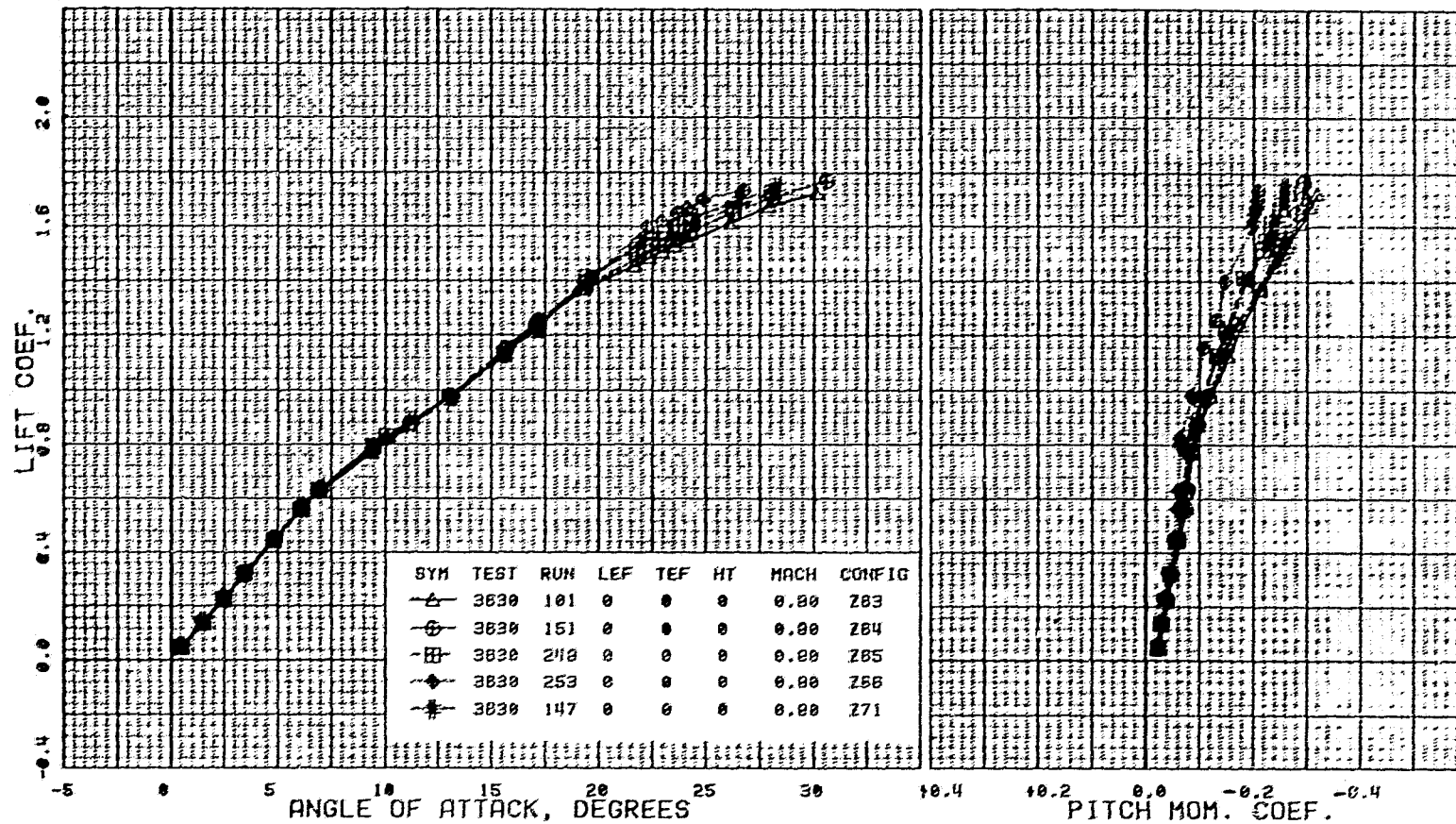


Figure 3-62 Effect of Forebody Strake Shape (Z63-Z66,Z71), YF-16+30.5 Stretch, LEF = 0, M = 0.90
(a) Lift and Pitching Moment

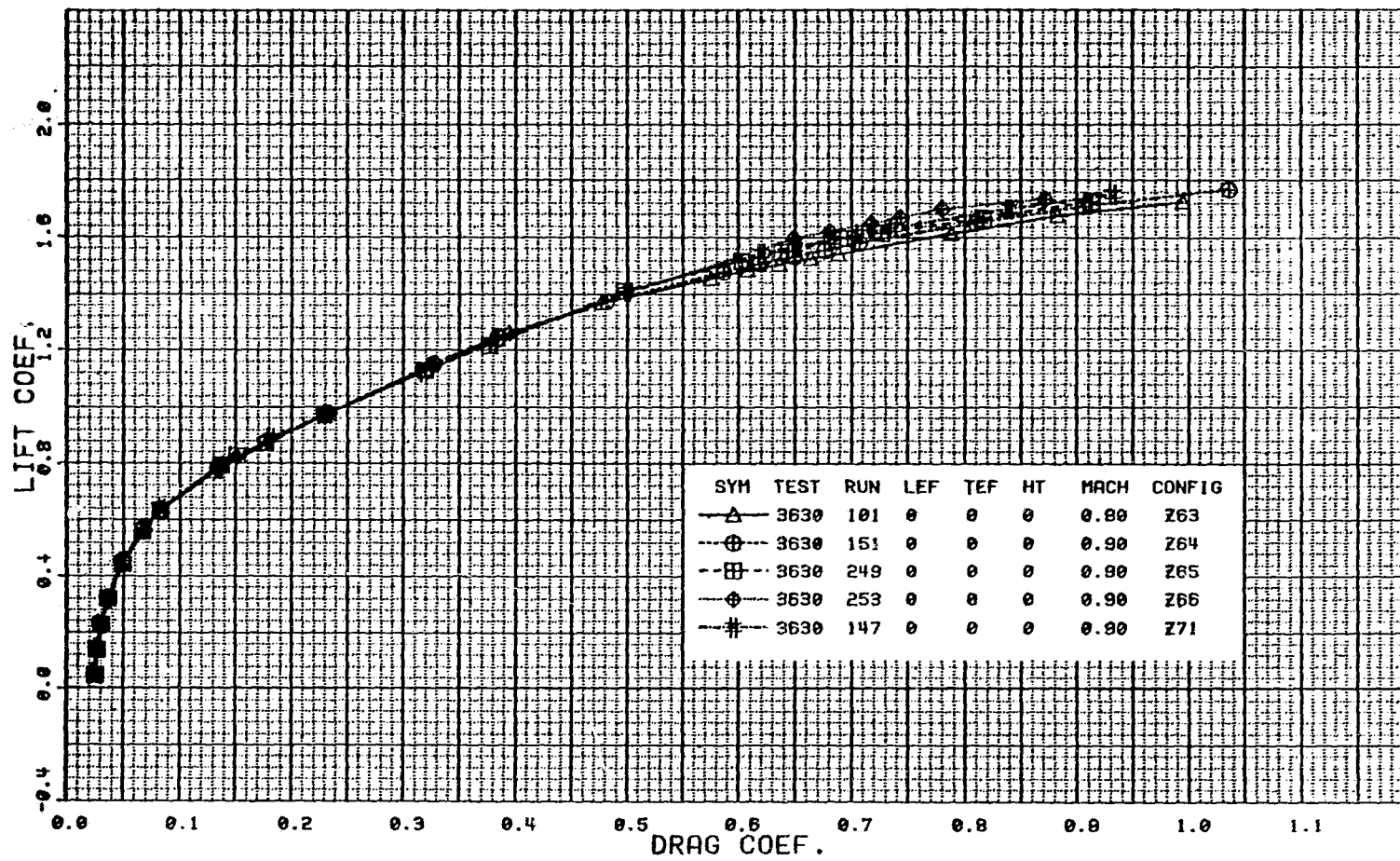


Figure 3-62 (b) Drag, Large Scale

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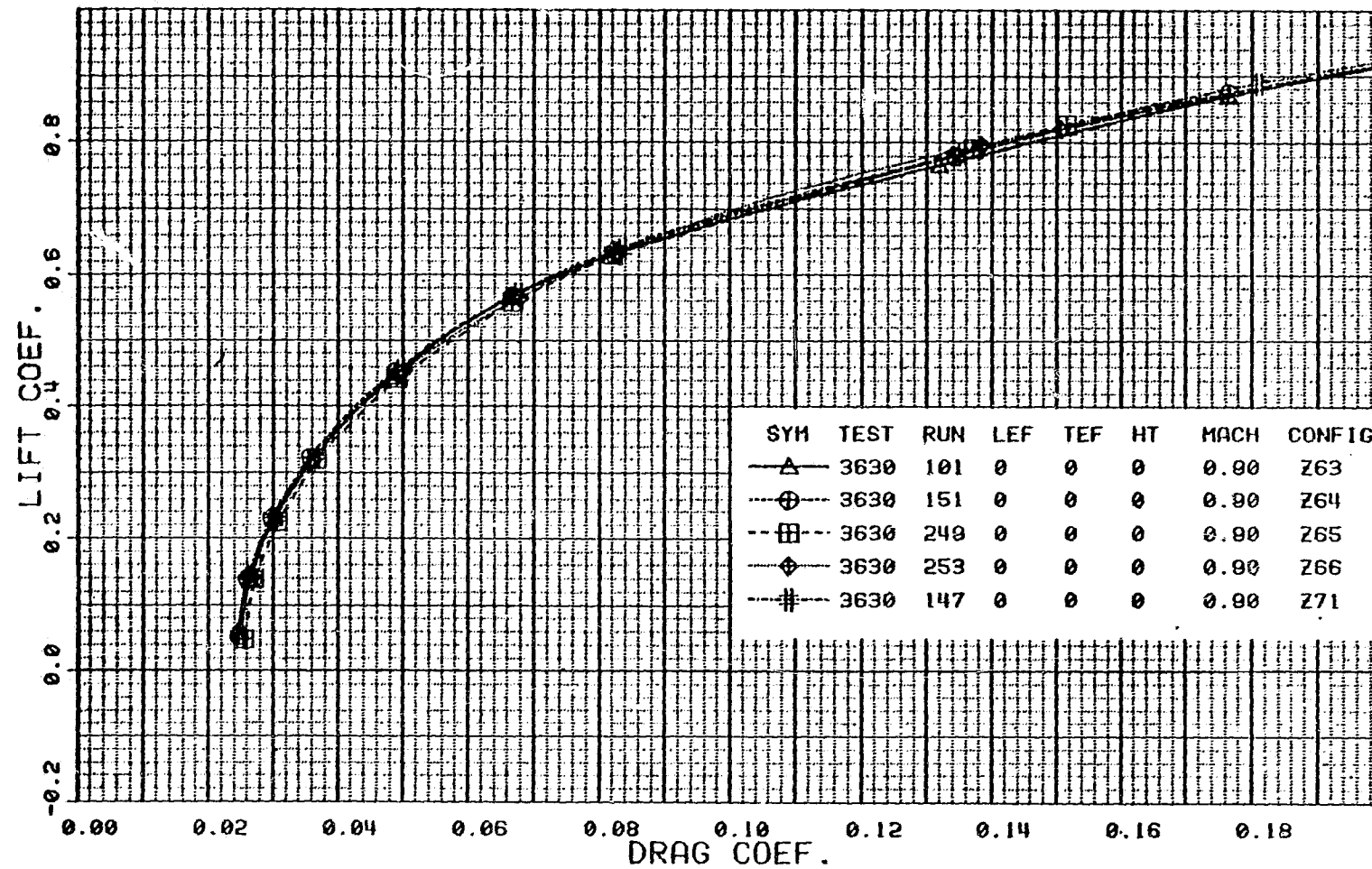


Figure 3-62 (c) Drag, Small Scale

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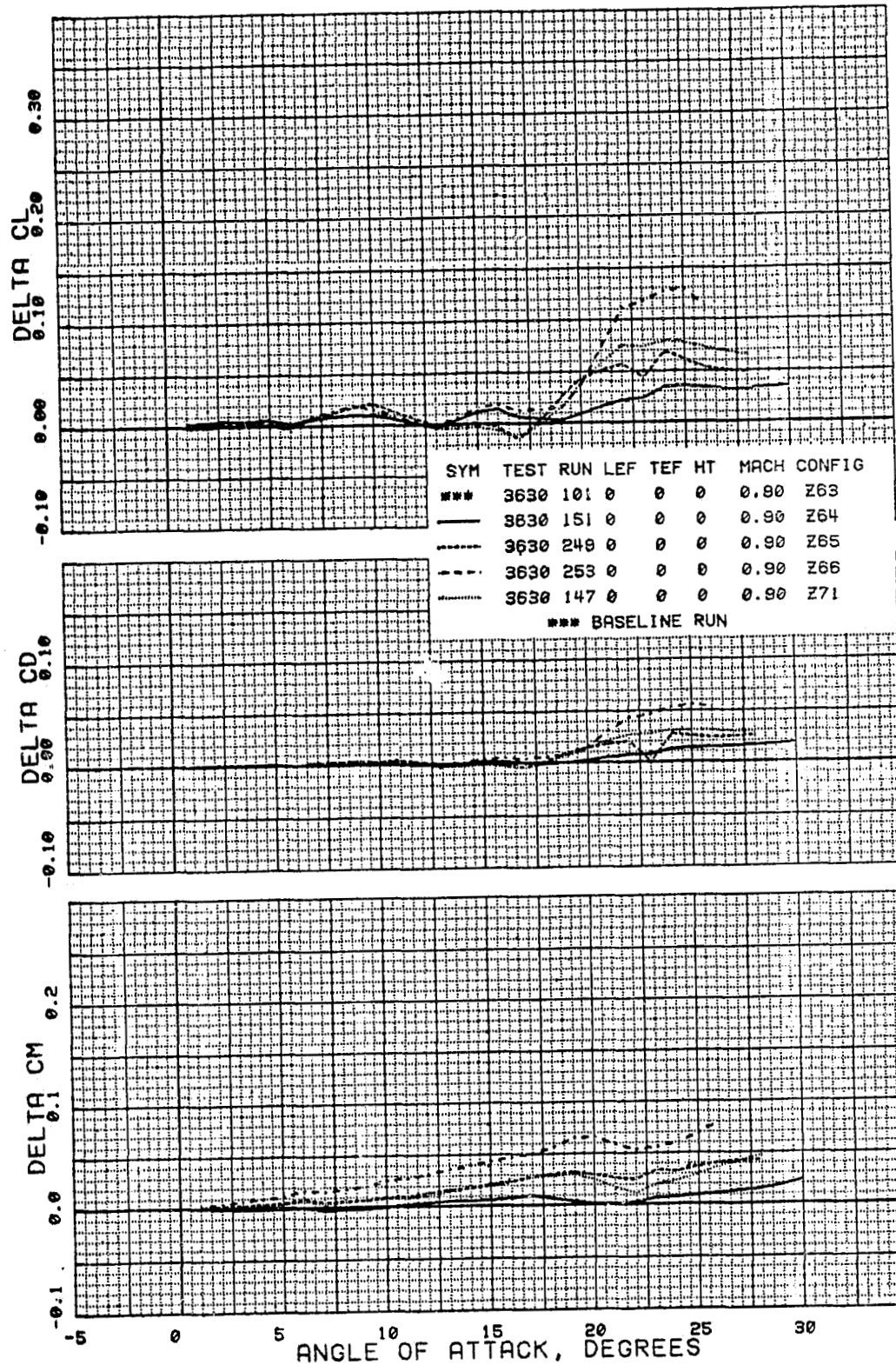


Figure 3-62 (d) Increments

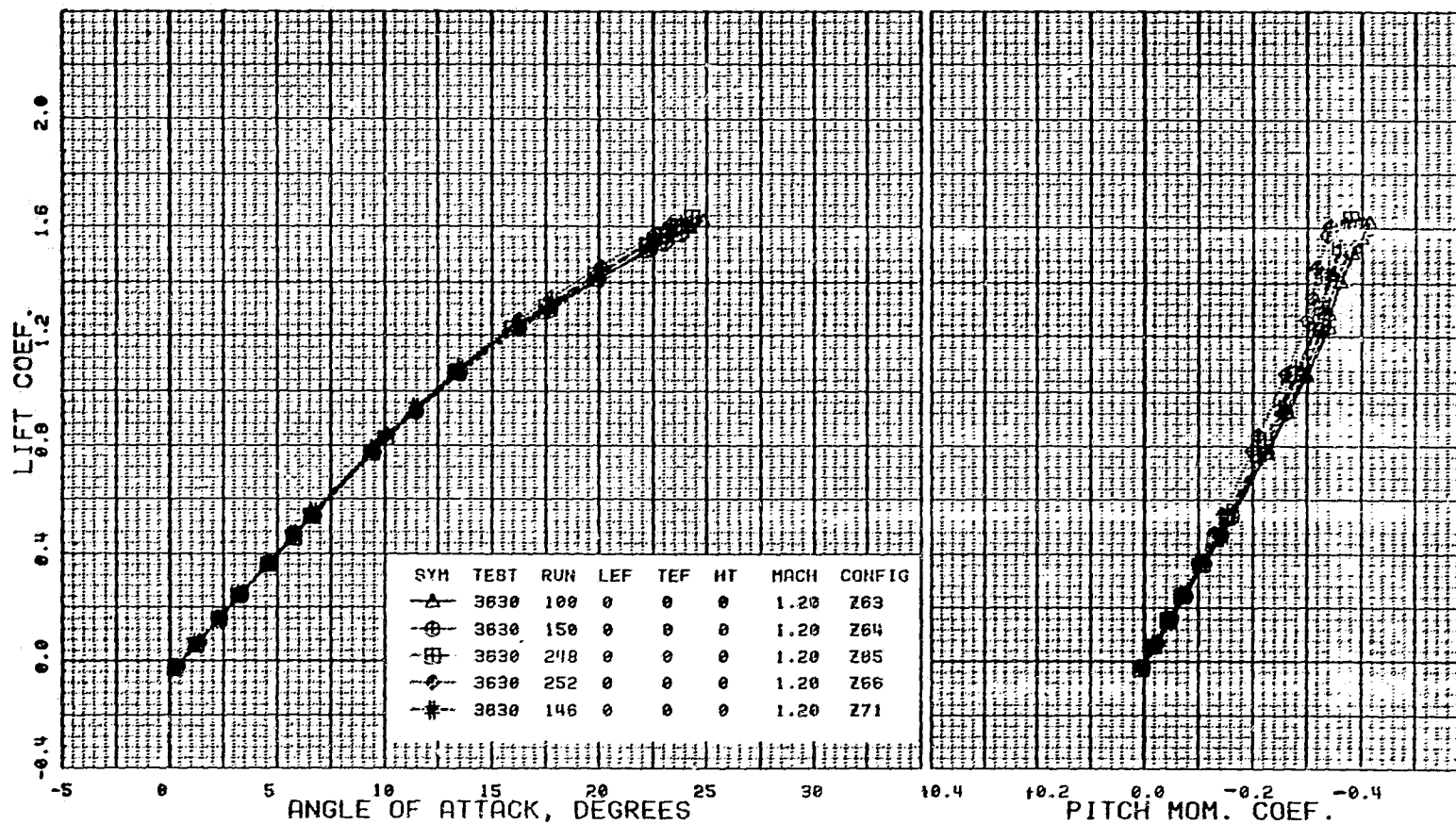


Figure 3-63 Effect of Forebody Strake Shape (Z63,-Z66,Z71), YF-16+ 30.5 Stretch, M = 1.20
(a) Lift and Pitching Moment

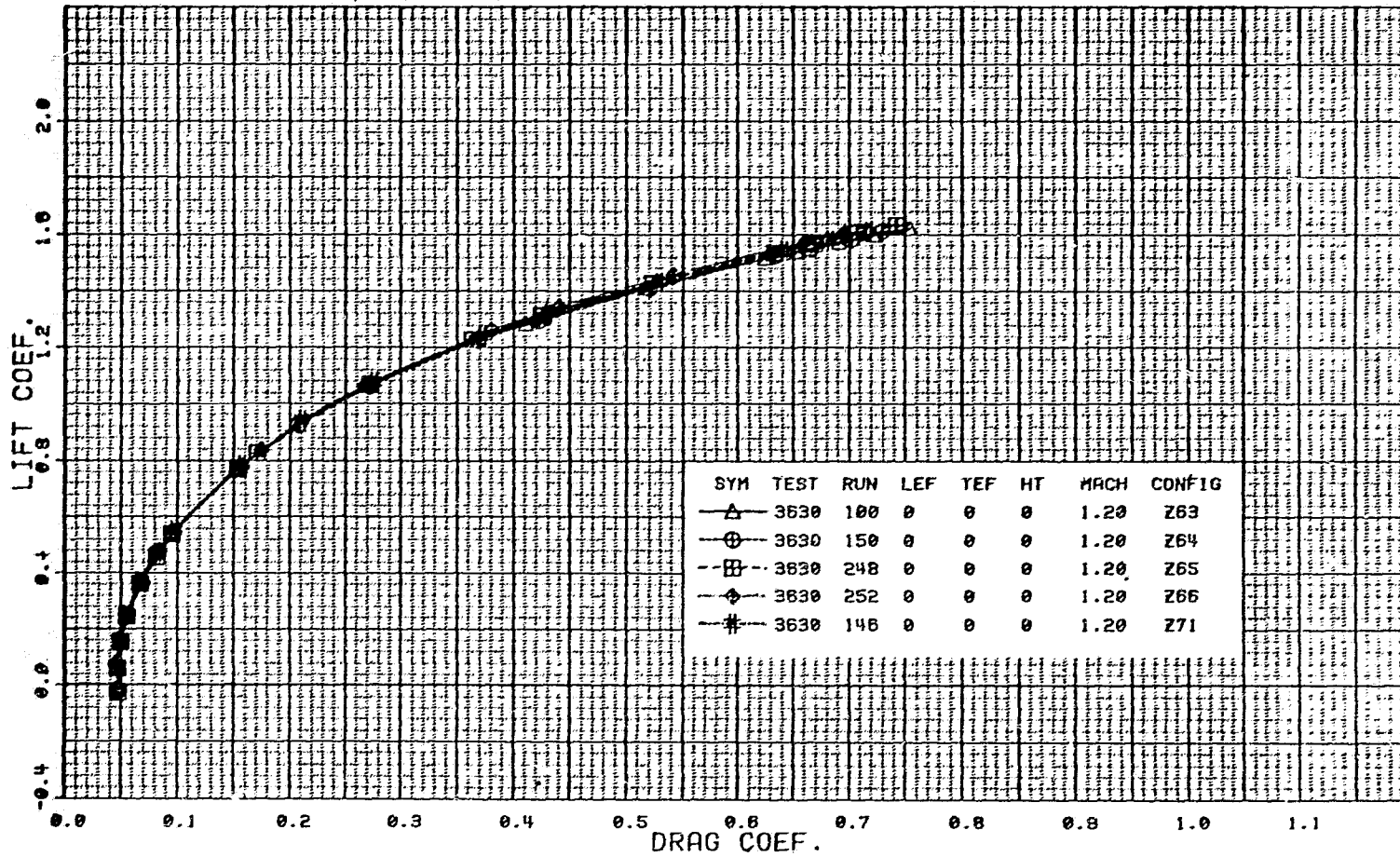


Figure 3-63 (b) Drag, Large Scale

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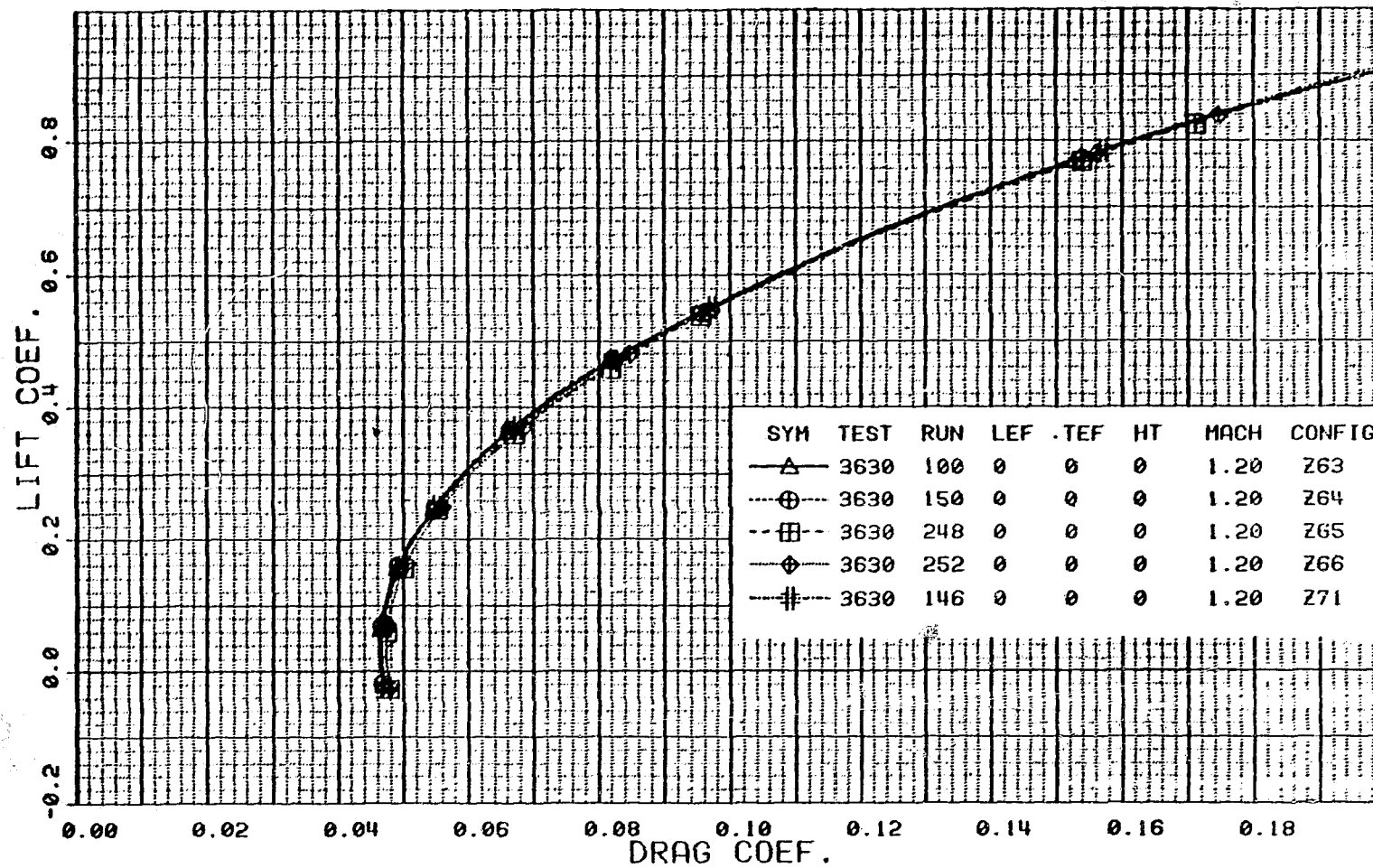


Figure 3-63 (c) Drag, Small Scale

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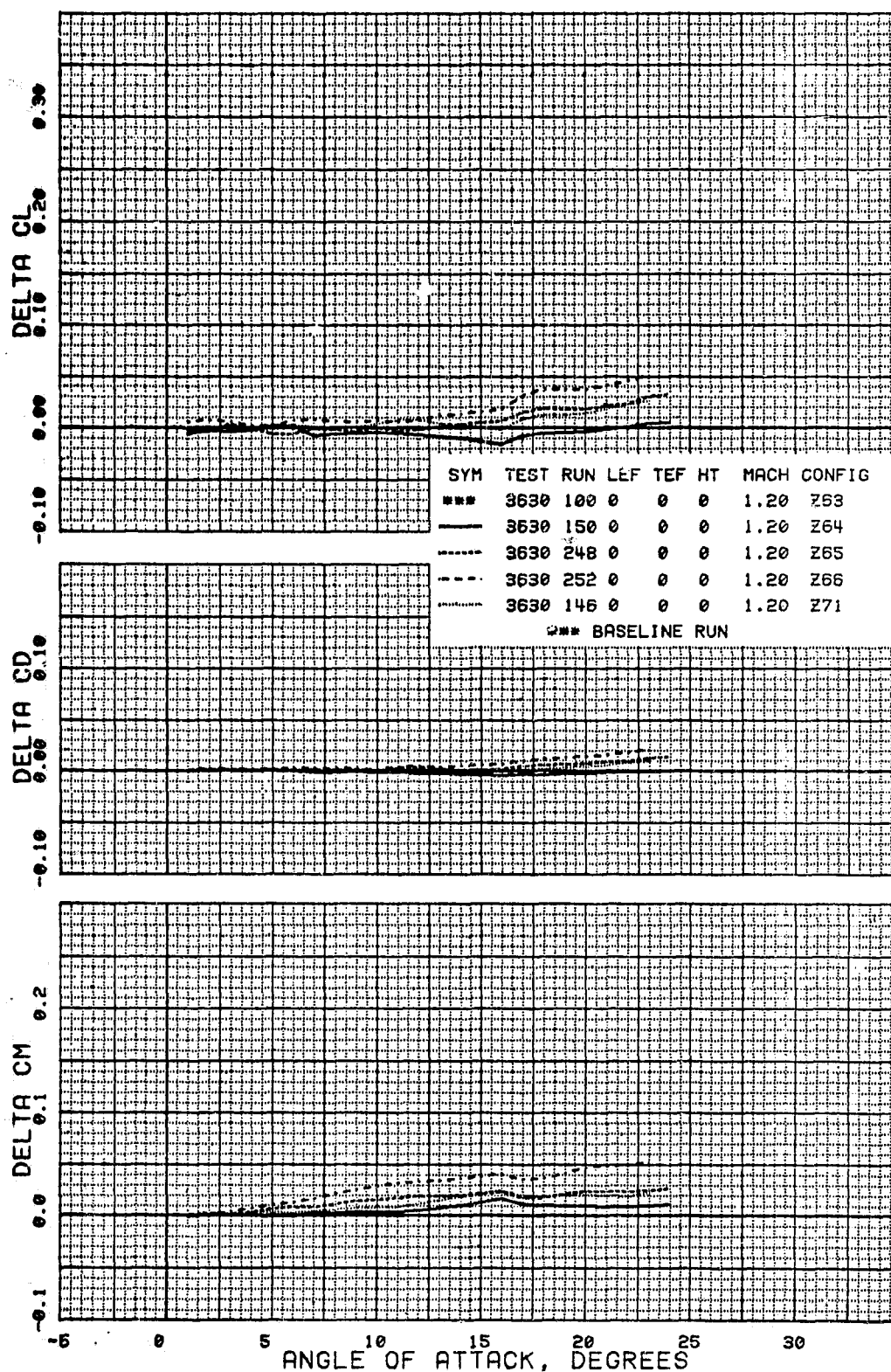


Figure 3-63 (d) Increments

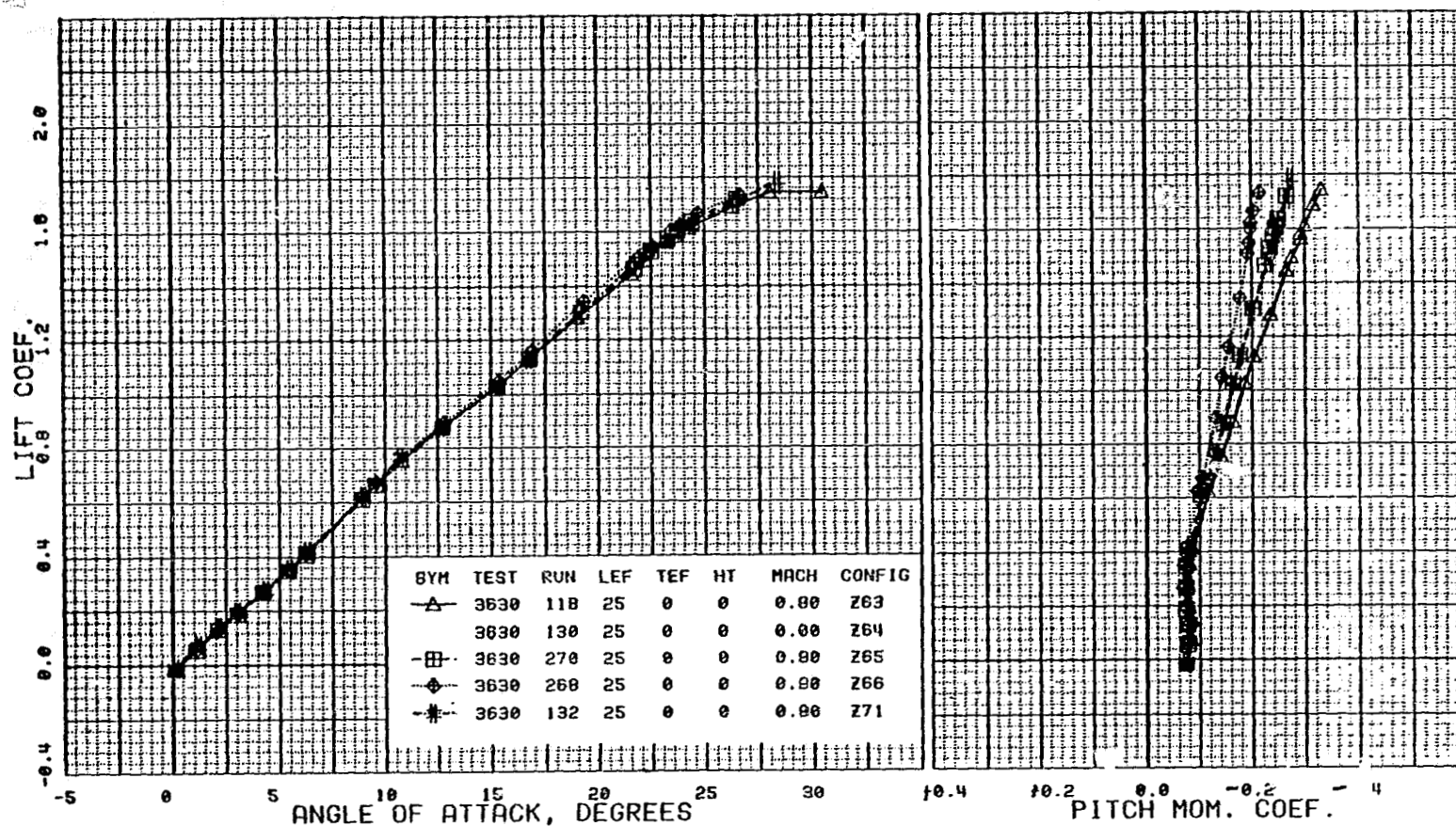


Figure 3-64 Effect of Forebody Strake Shape (Z63-Z66,Z71), YF-16+ 30.5
 : Stretch, LEF = 25°, M = 0.90
 (a) Lift and Pitching Moment

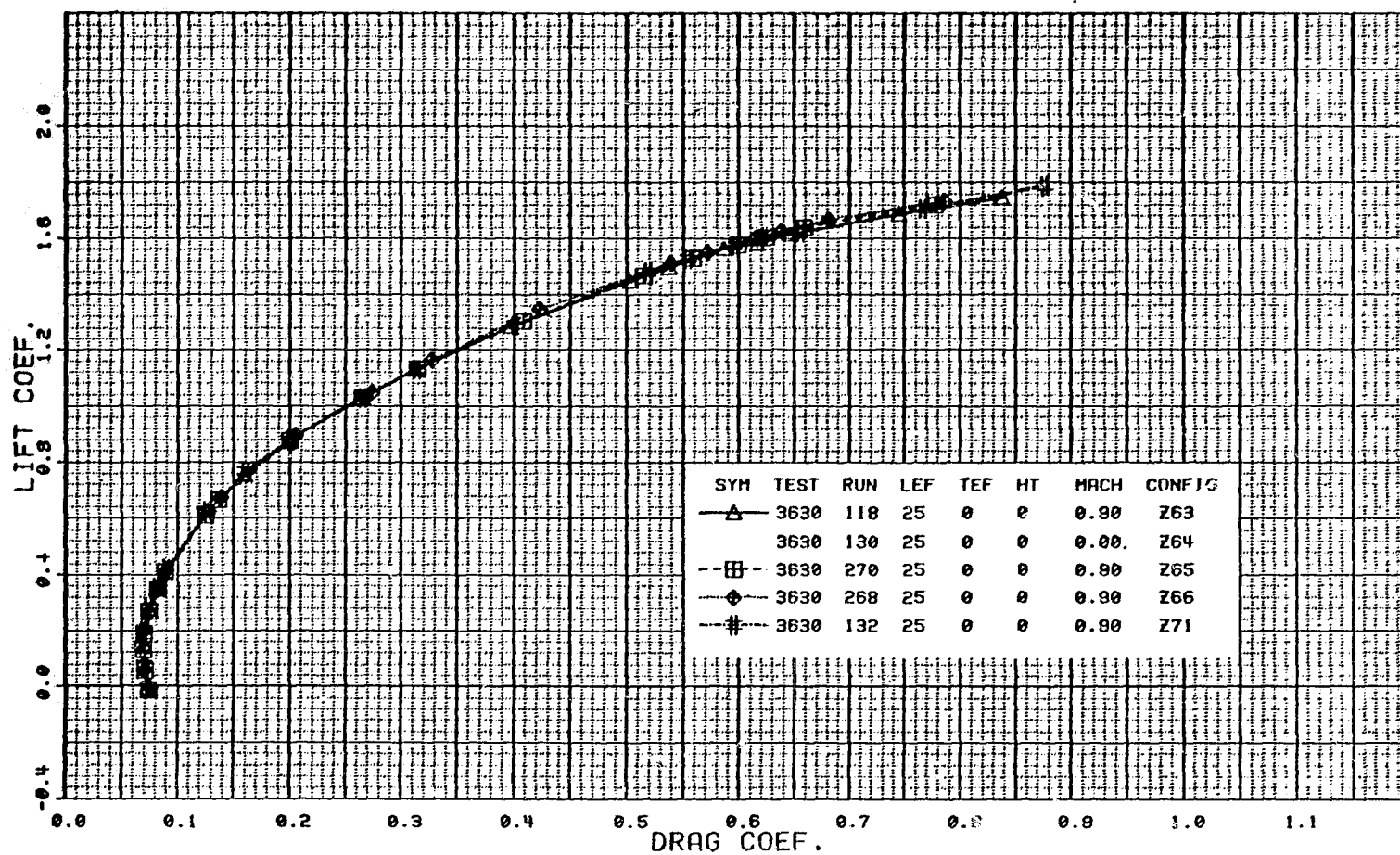


Figure 3-64 (b) Drag, Large Scale

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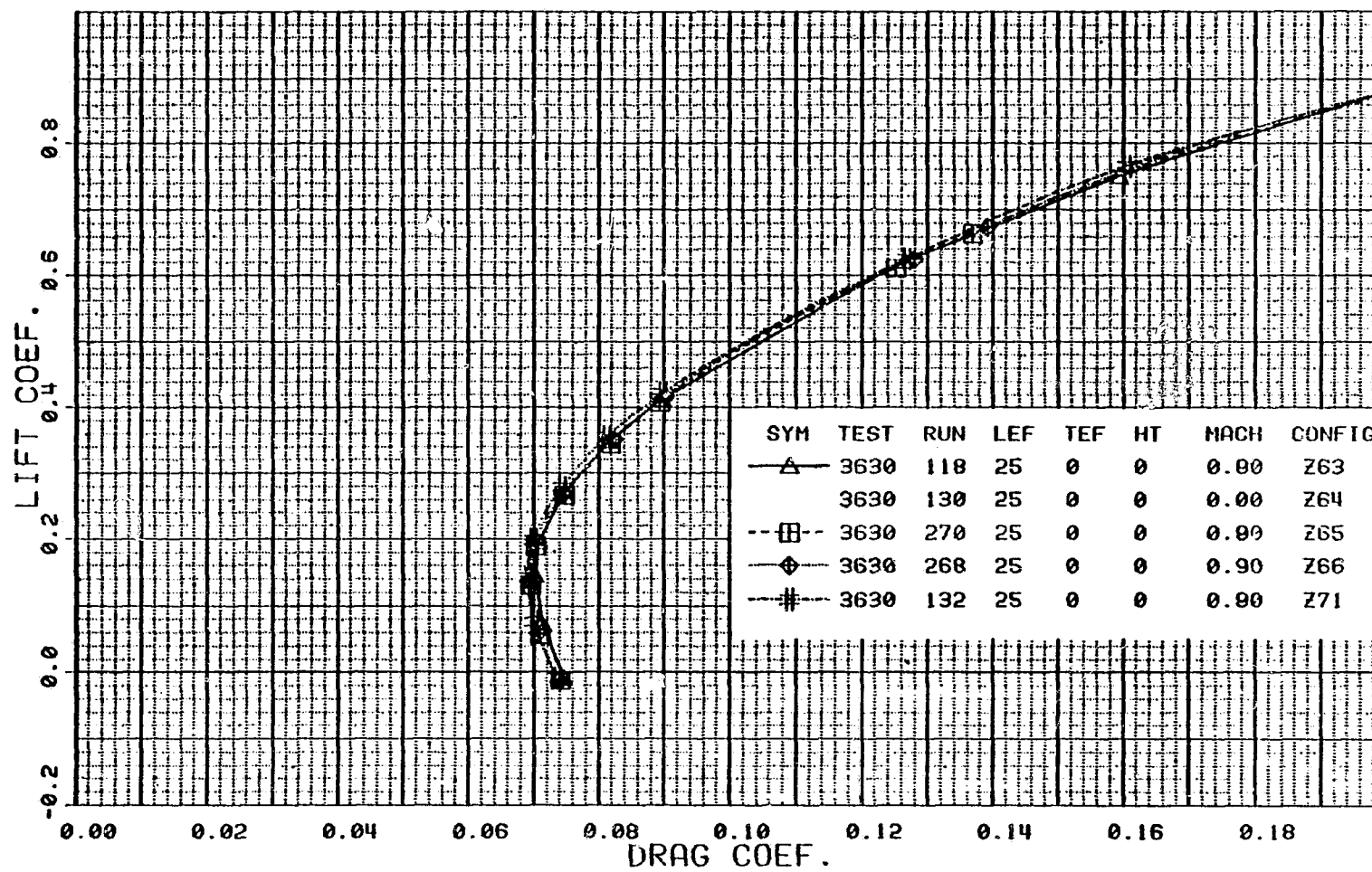


Figure 3-64 (c) Drag, Small Scale

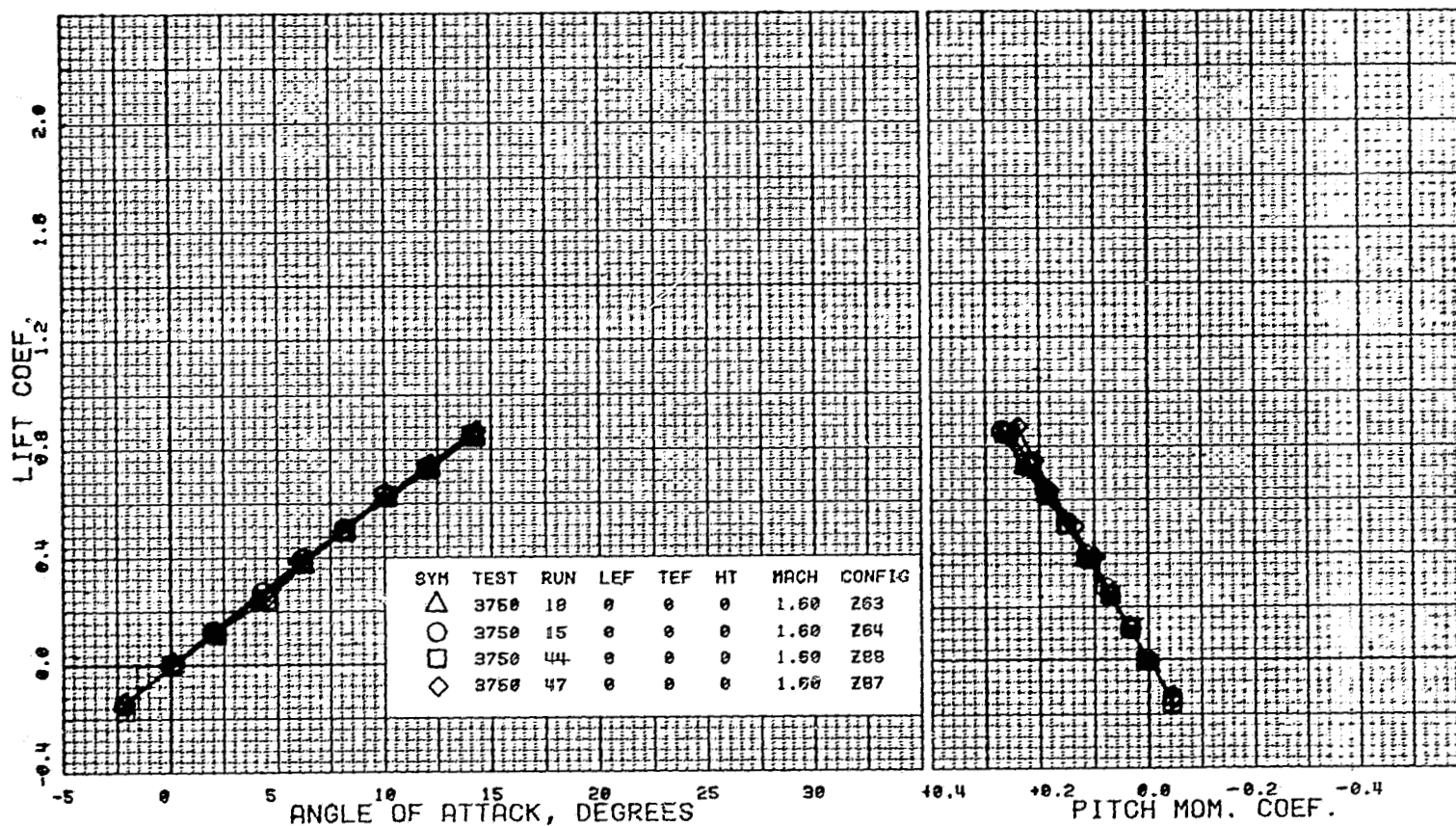


Figure 3-65 Effect of Forebody Strake Shape (Z63,Z64,Z87,Z88) YF-16+
30.5 Stretch, $M = 1.60$
(a) Lift and Pitching Moment

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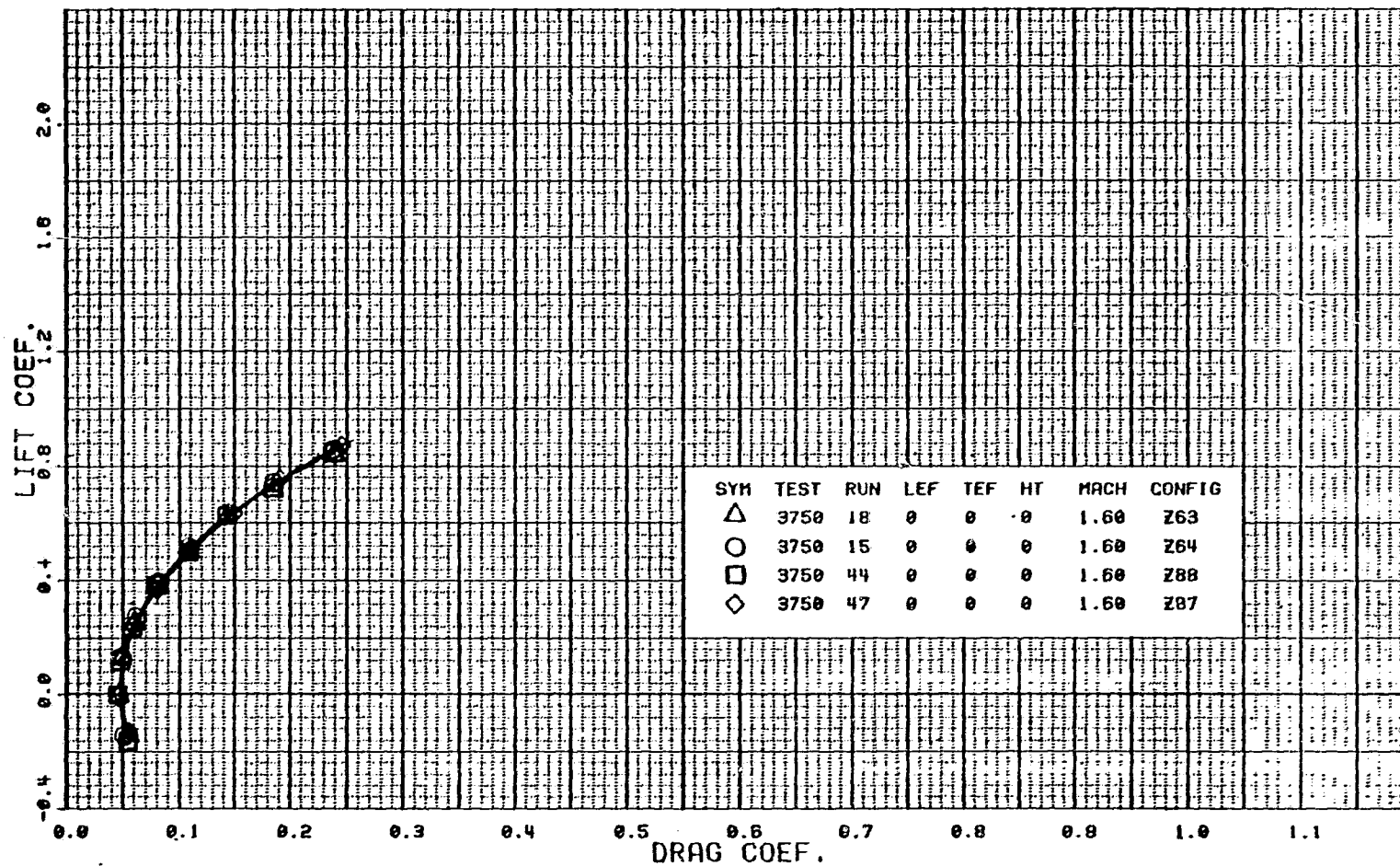


Figure 3-65 (b) Drag, Large Scale

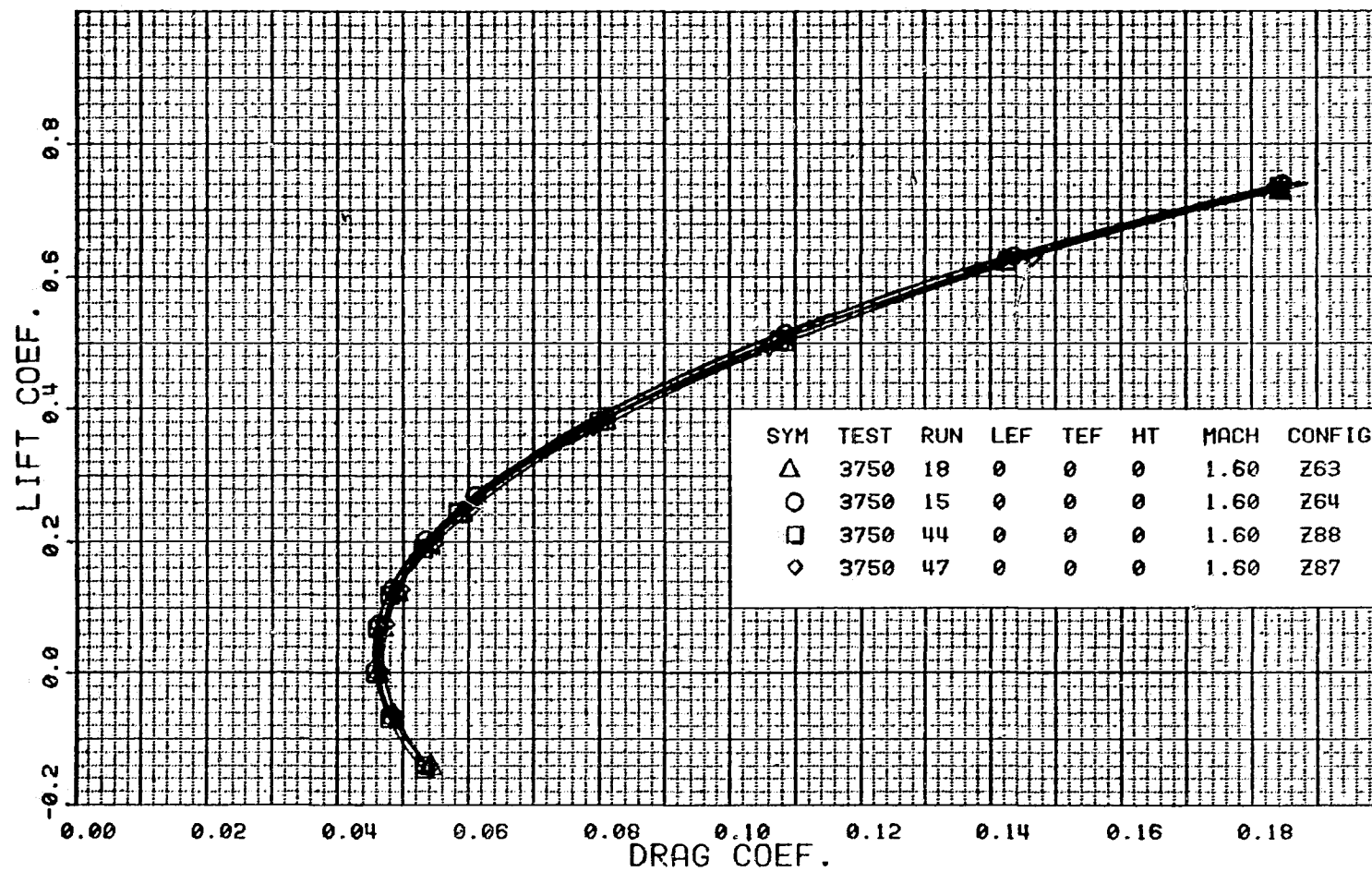


Figure 3-65 (c) Drag, Small Scale

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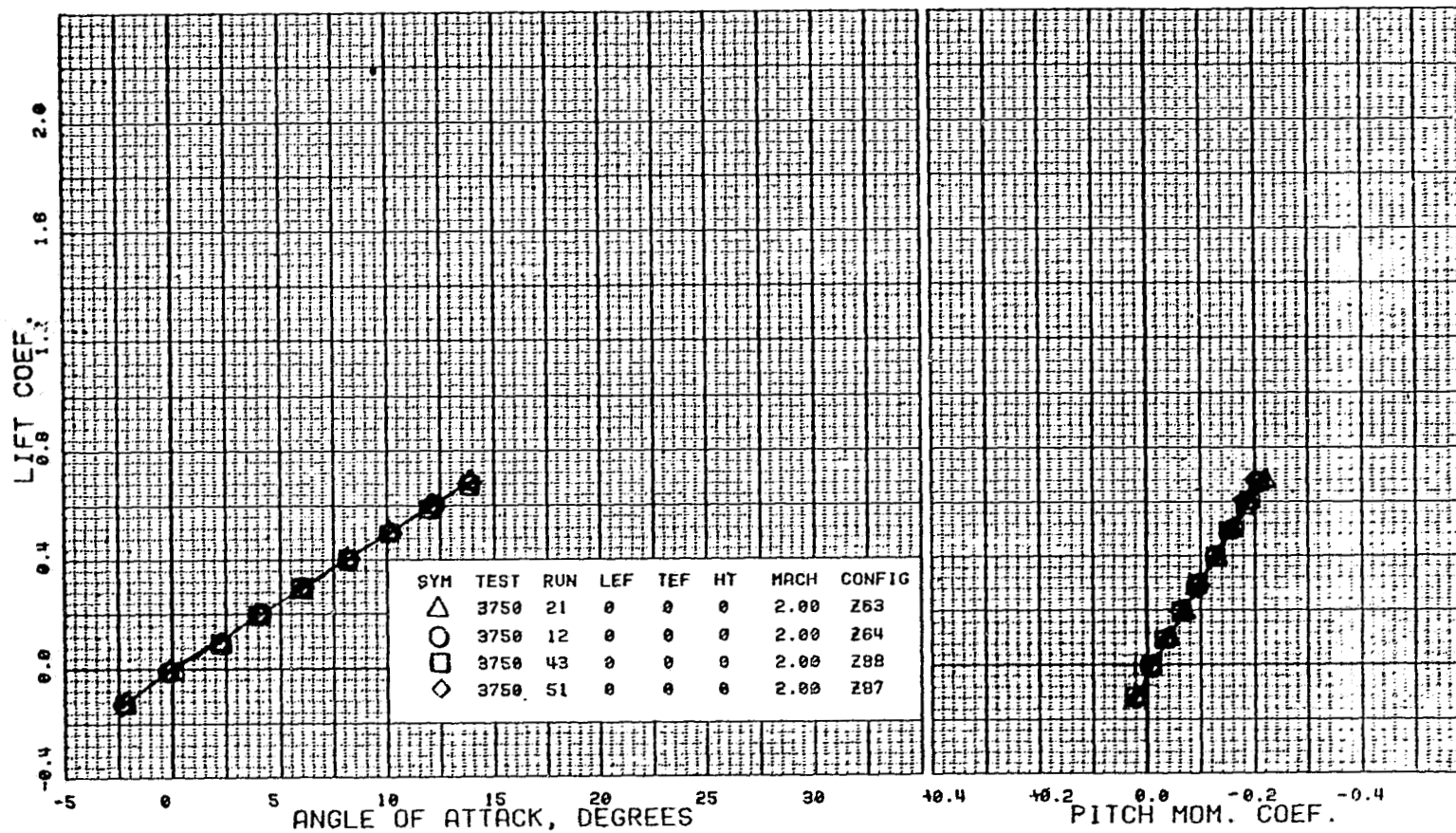


Figure 3-66 Effect of Forebody Strake Shape (Z63,Z64,Z87-Z88) YF-16 + 30.5 Stretch, M = 2.00
(a) Lift and Pitching Moment

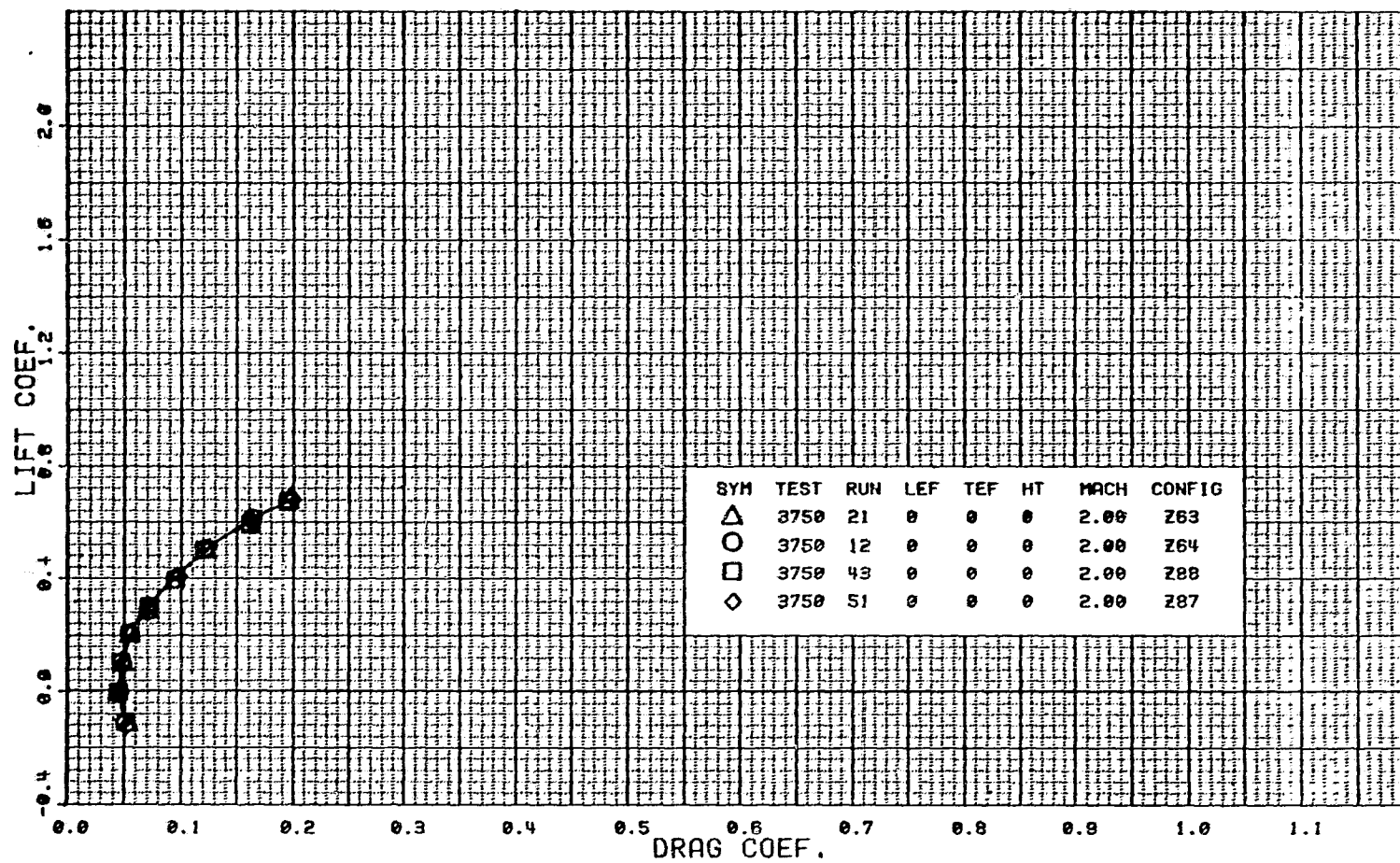


Figure 3-66 (b) Drag, Large Scale

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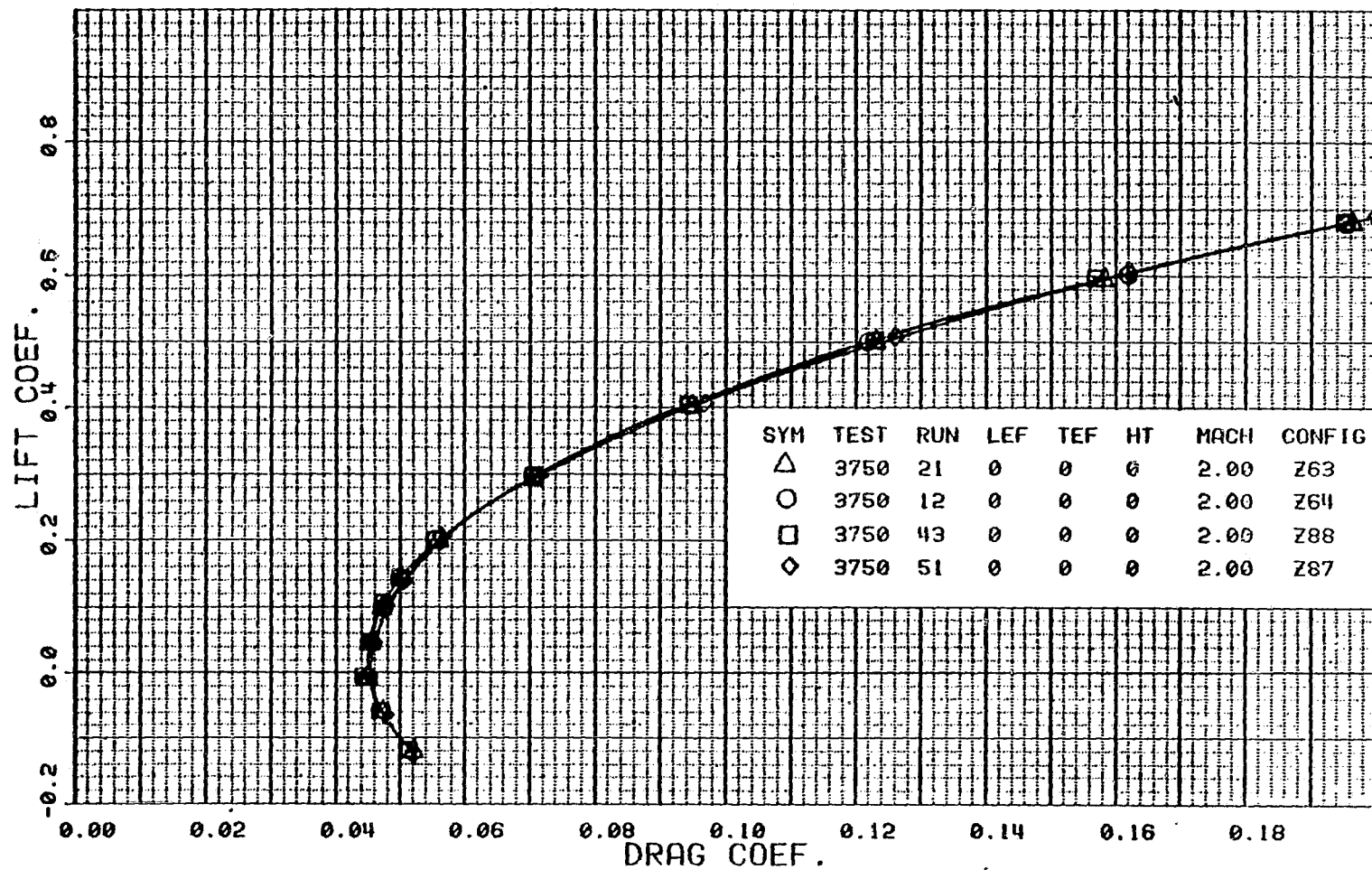


Figure 3-66 (c) Drag, Small Scale

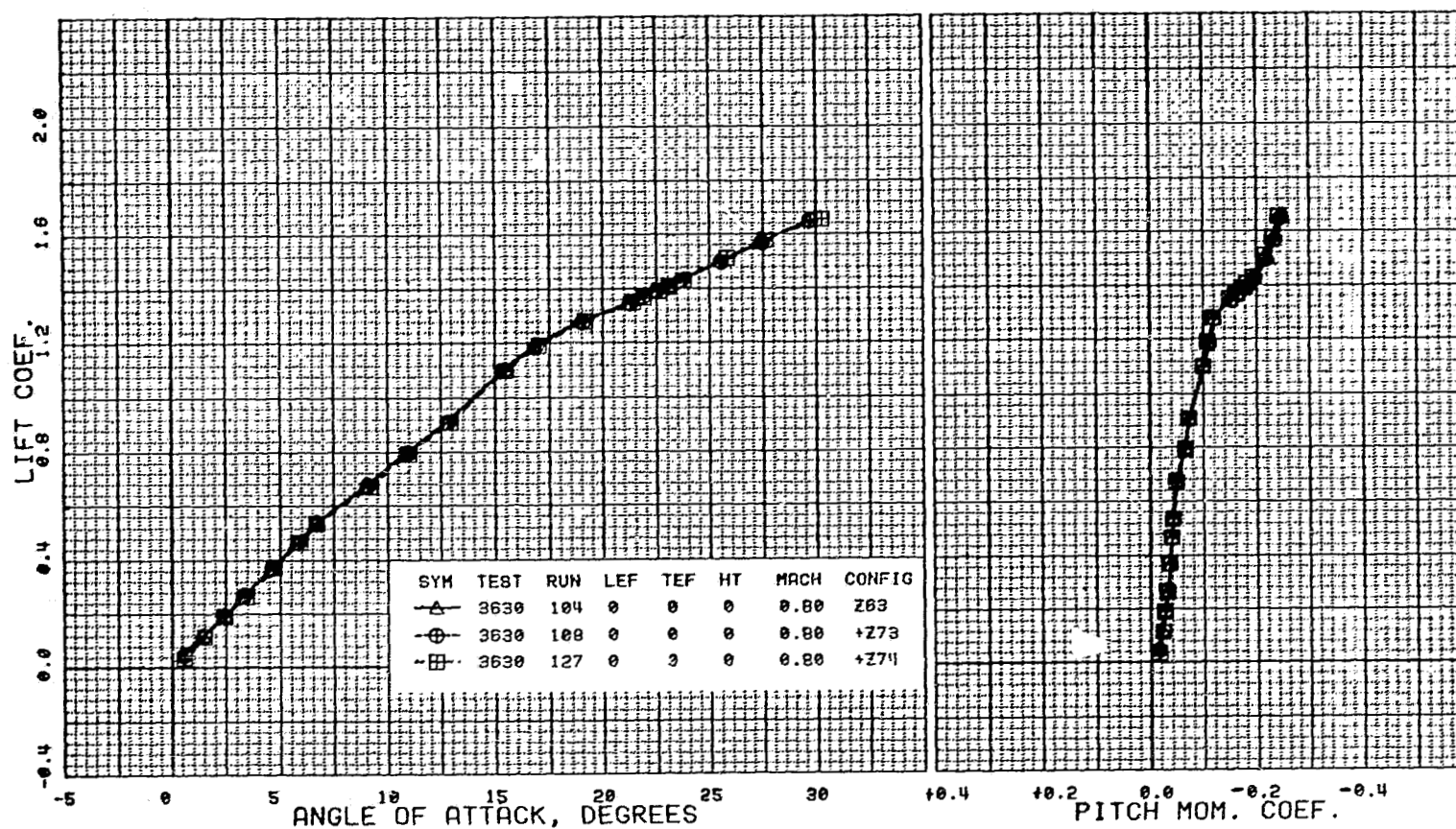


Figure 3-67 Effect of Nose Strakes Z73 and Z74, YF-16+30.5 Stretch,
 $M = 0.80$
 (a) Lift and Pitching Moment

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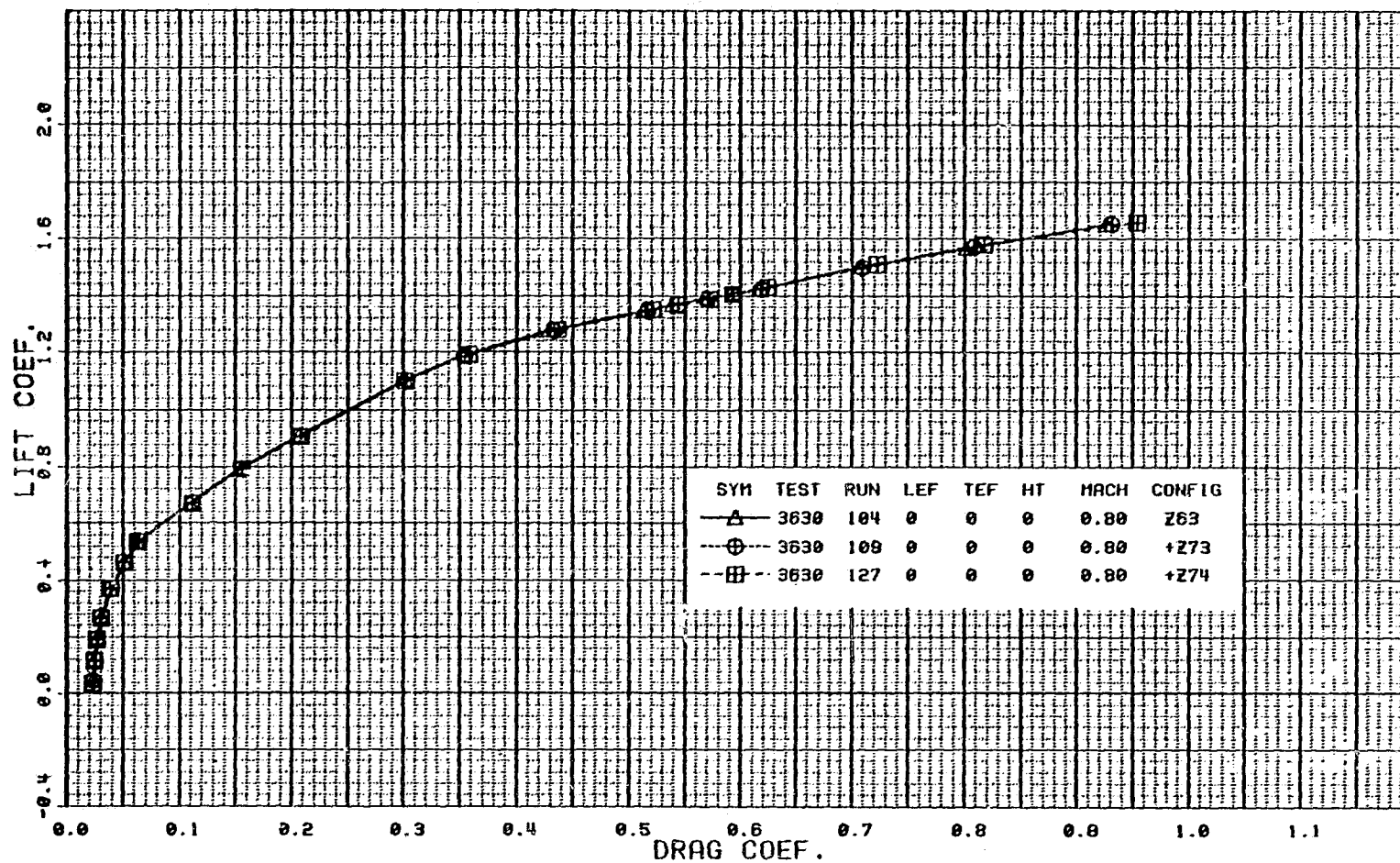


Figure 3-67 (b) Drag, Large Scale

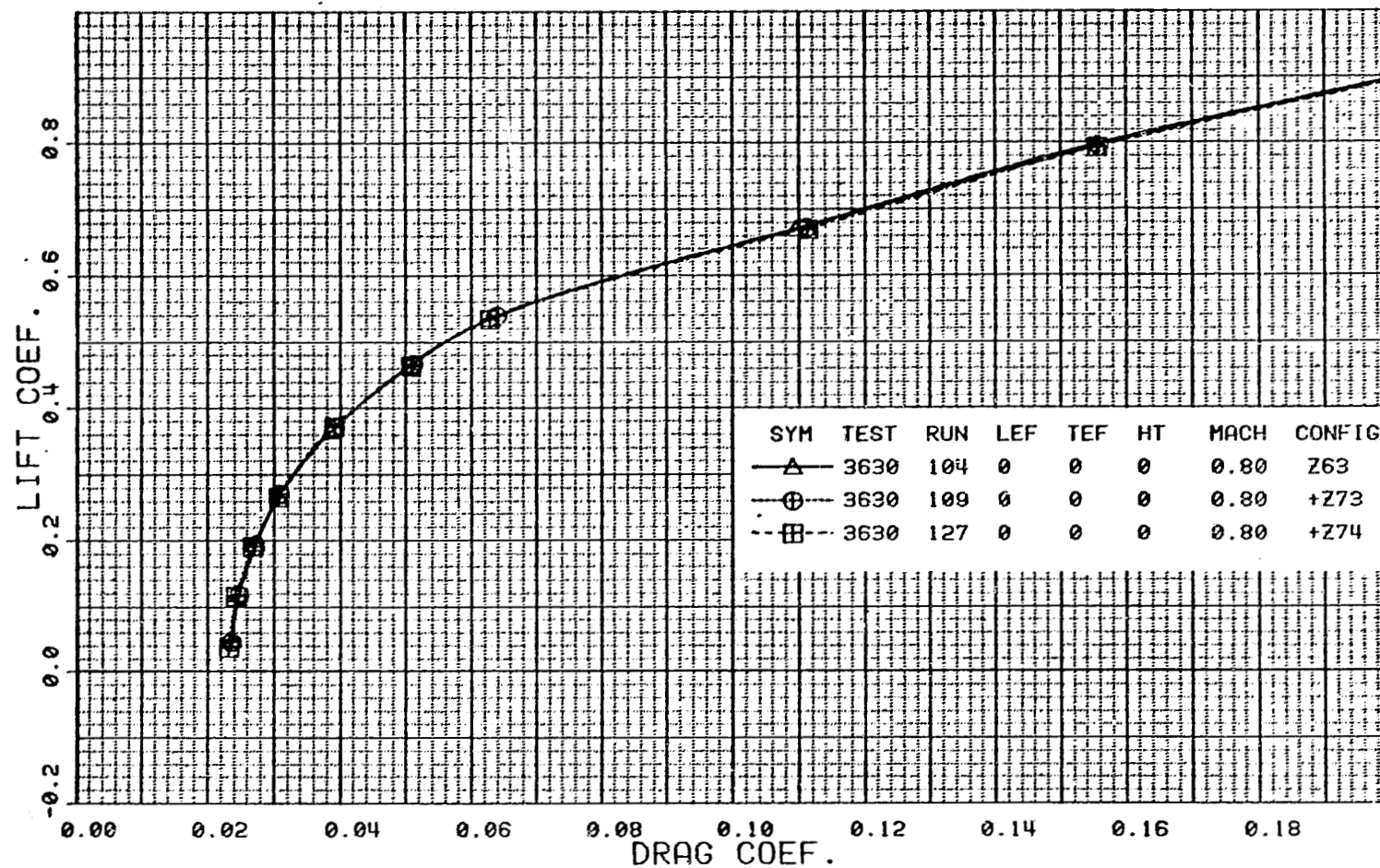


Figure 3-67 (c) Drag, Small Scale

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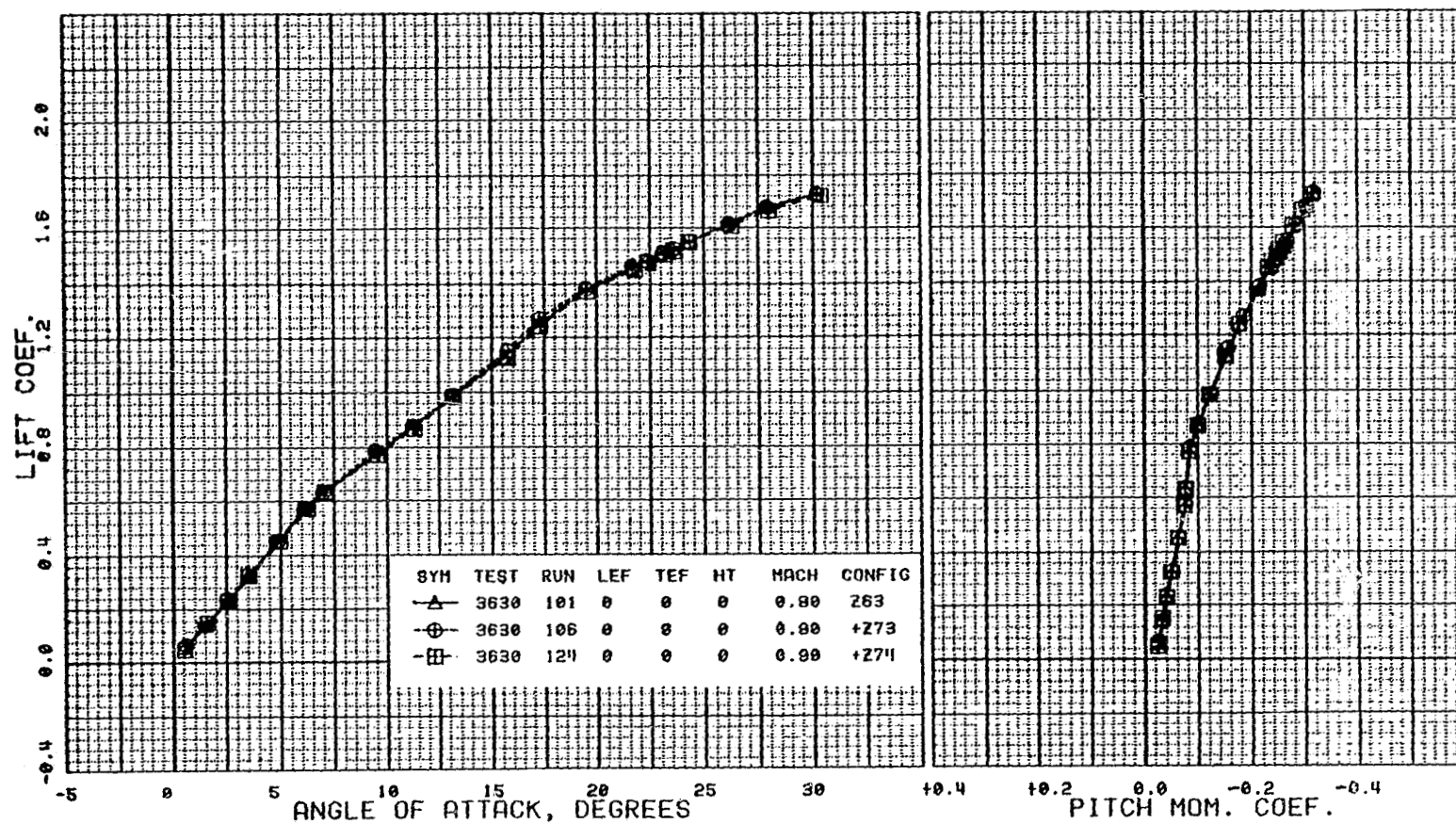


Figure 3-68 Effect of Nose Strakes Z73 and Z74, YF-16+30.5 Stretch,
 $M = 0.90$
 (a) Lift and Pitching Moment

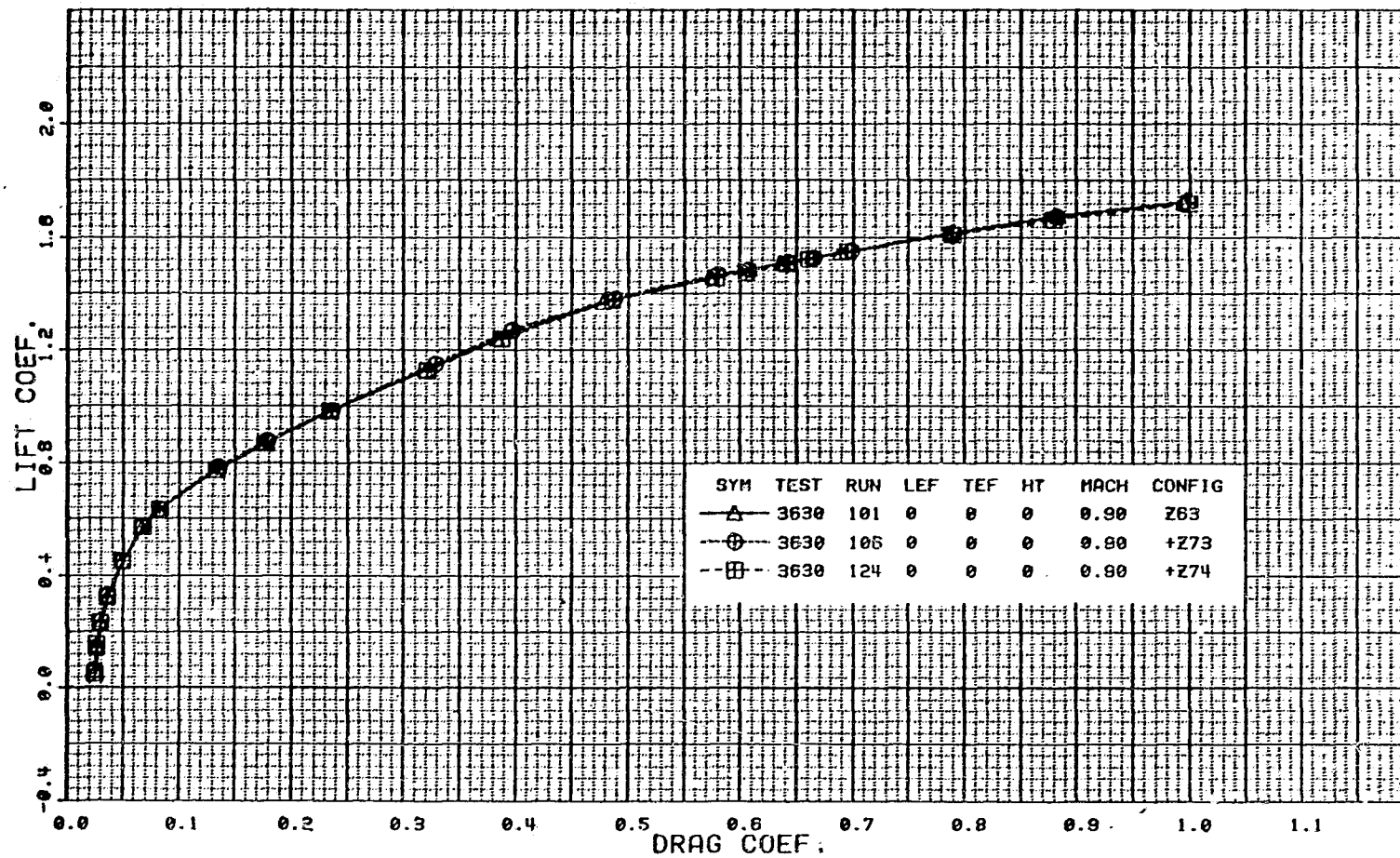


Figure 3-68 (b) Drag, Large Scale

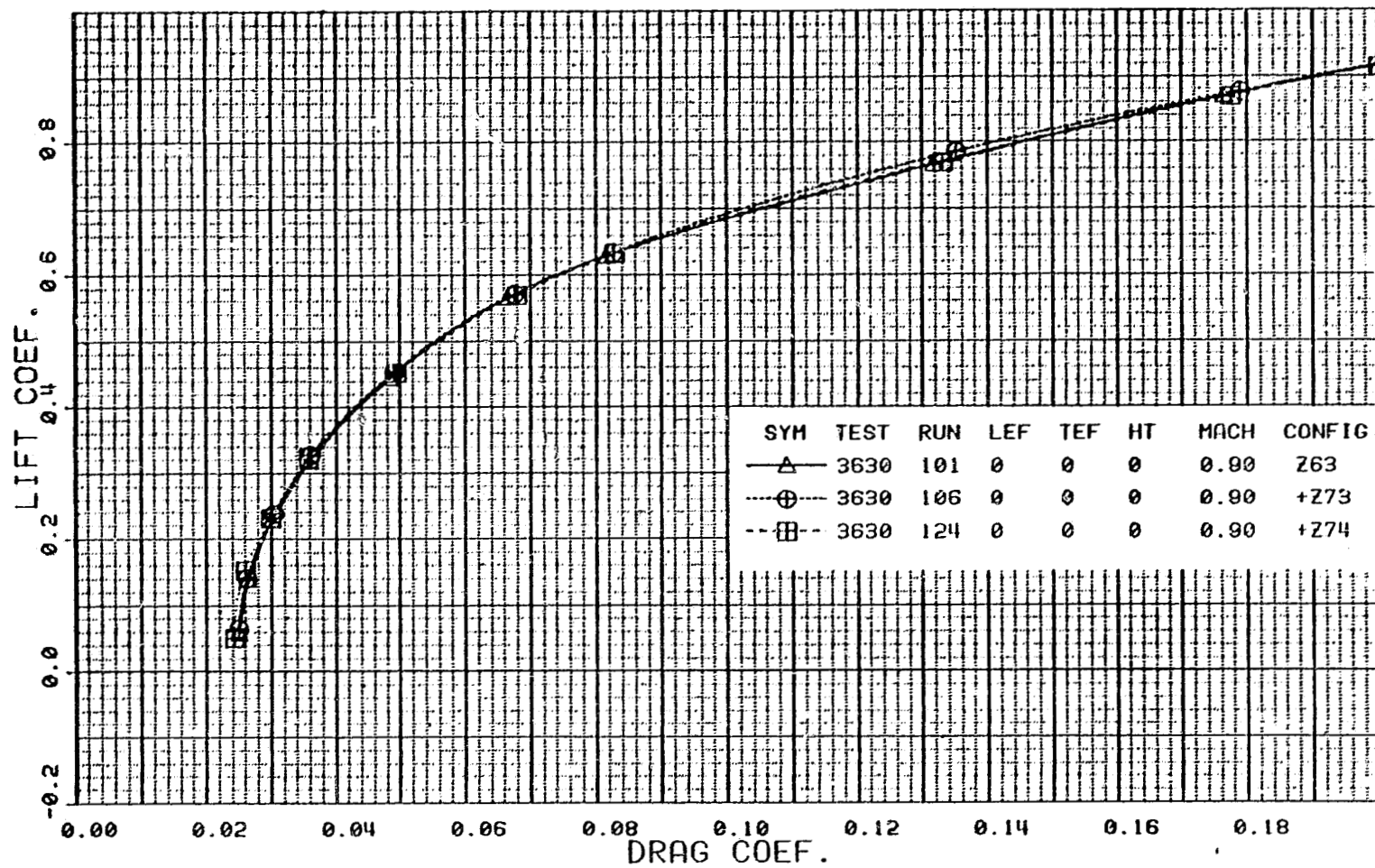


Figure 3-68 (c) Drag, Small Scale

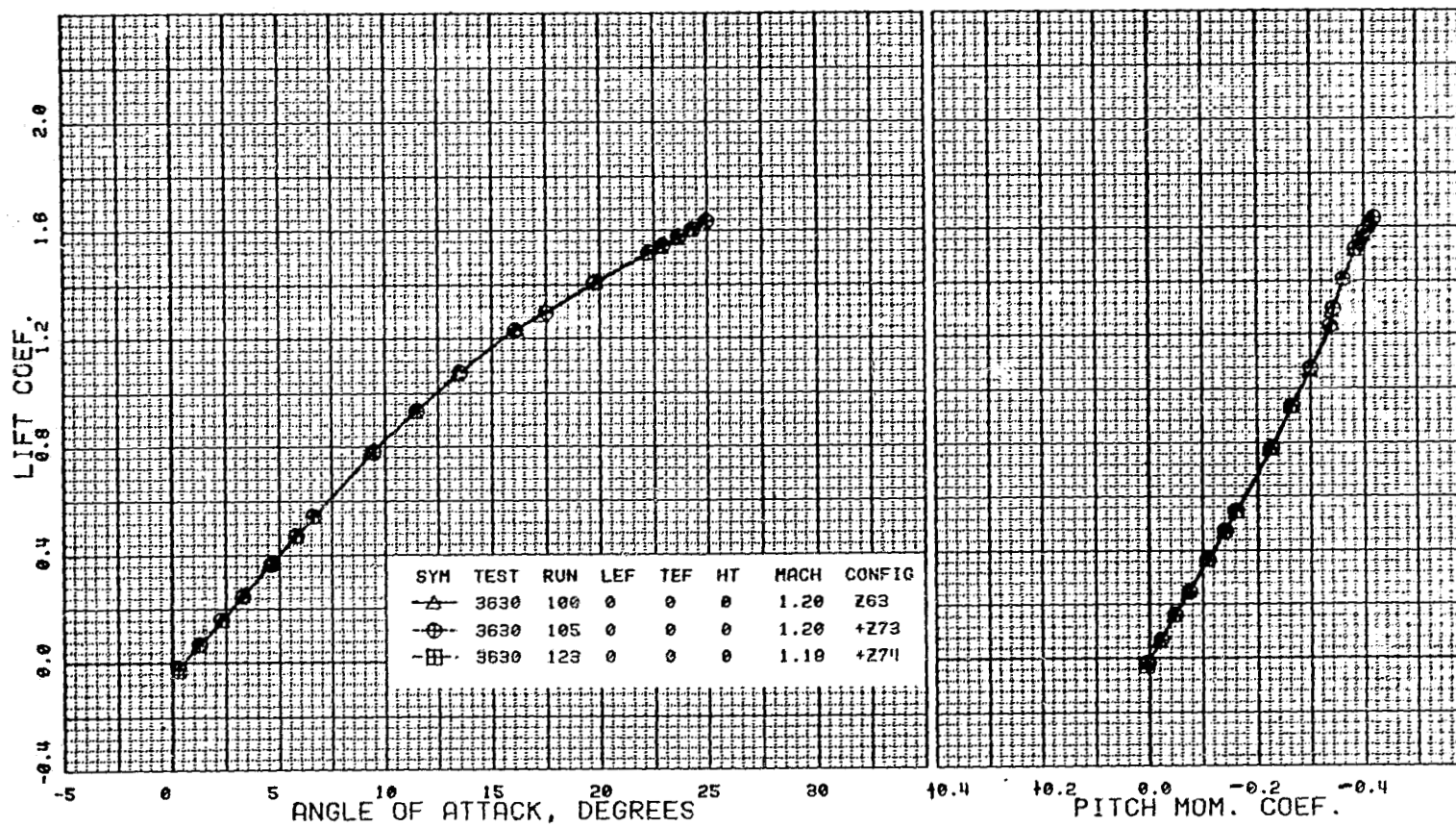


Figure 3-69 Effect of Nose Strakes Z73 and Z74, YF-16+30.5 Stretch,
 $M = 1.20$
 (a) Lift and Pitching Moment

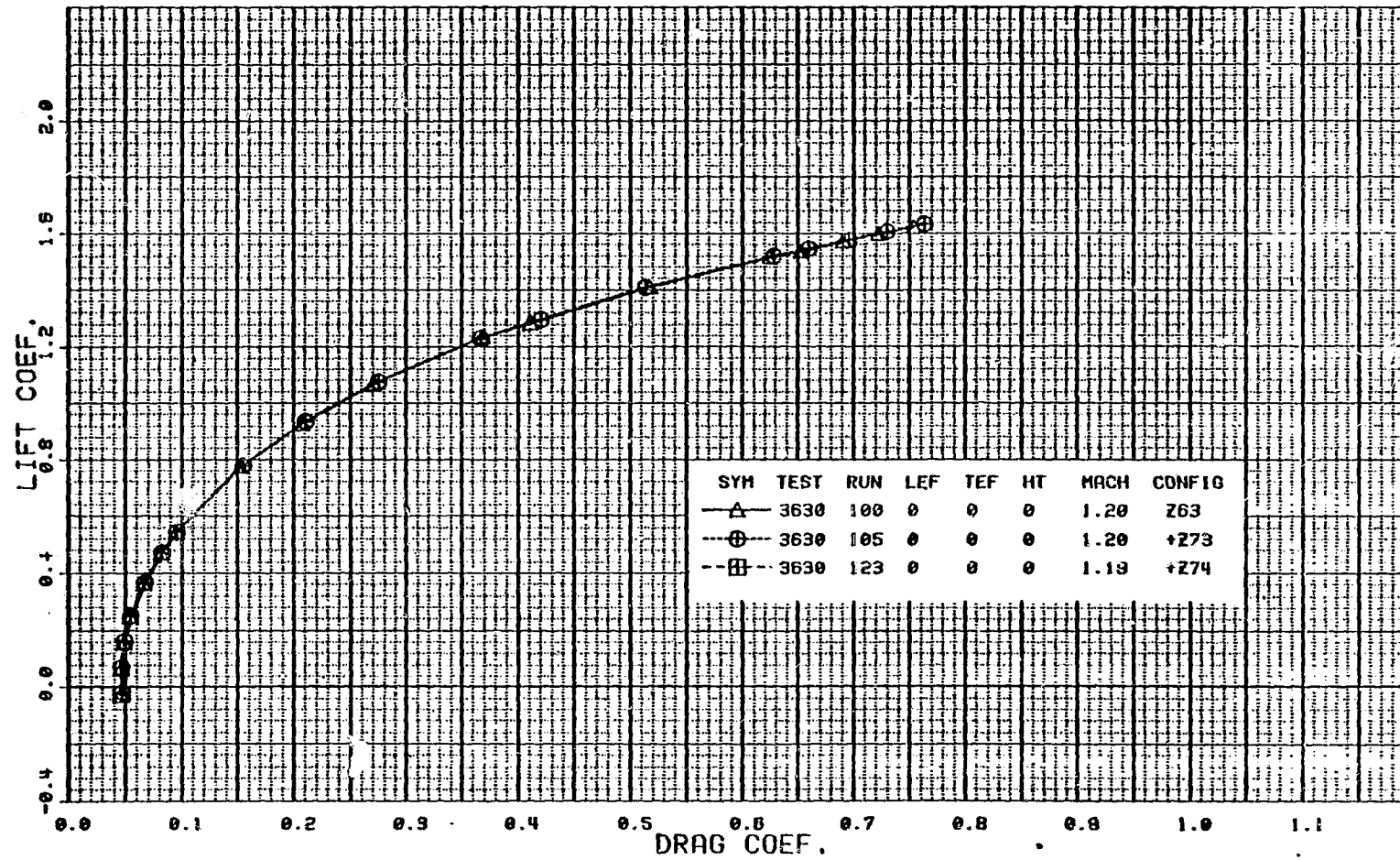


Figure 3-69 (b) Drag, Large Scale

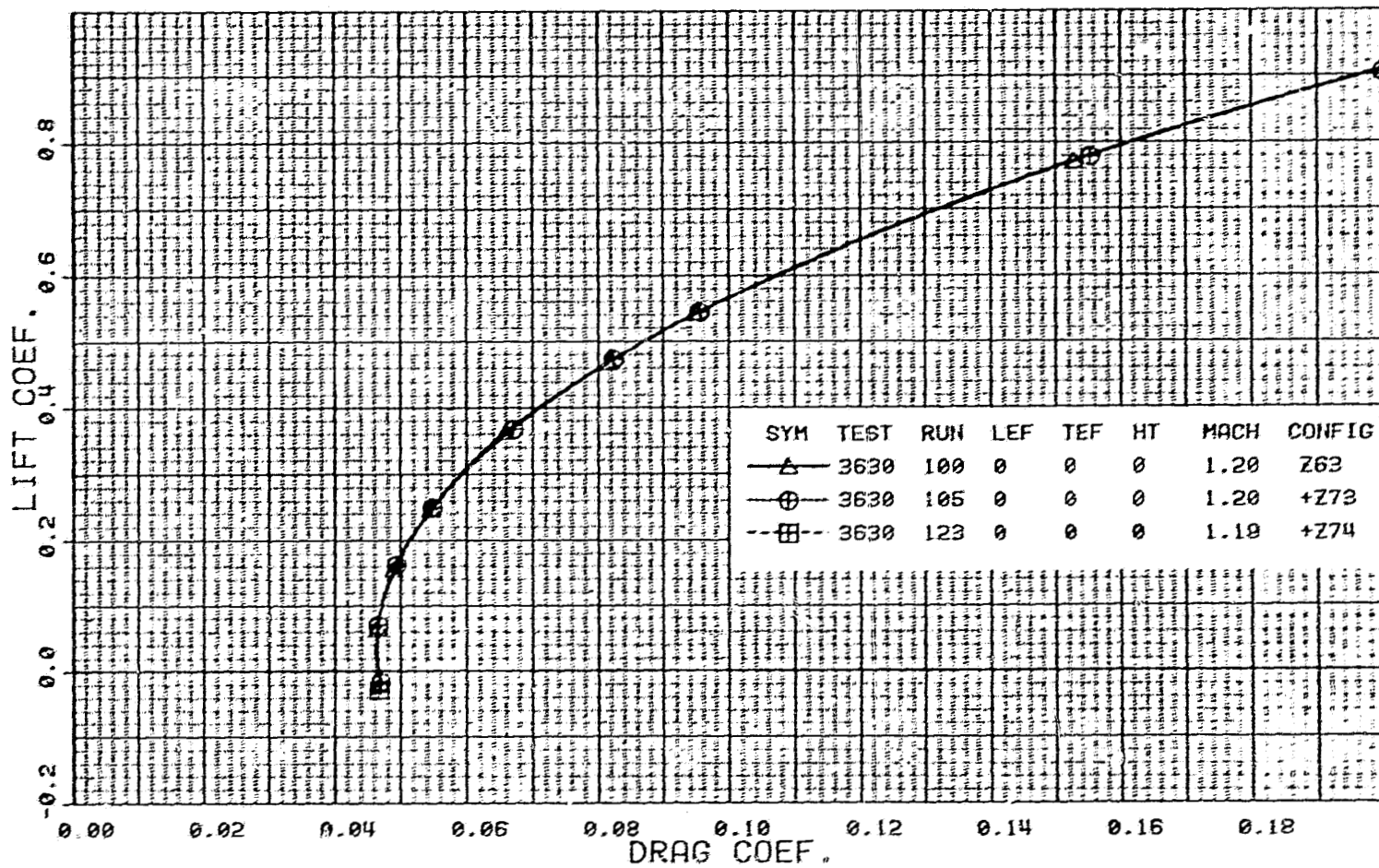


Figure 3-69 (c) Drag, Small Scale

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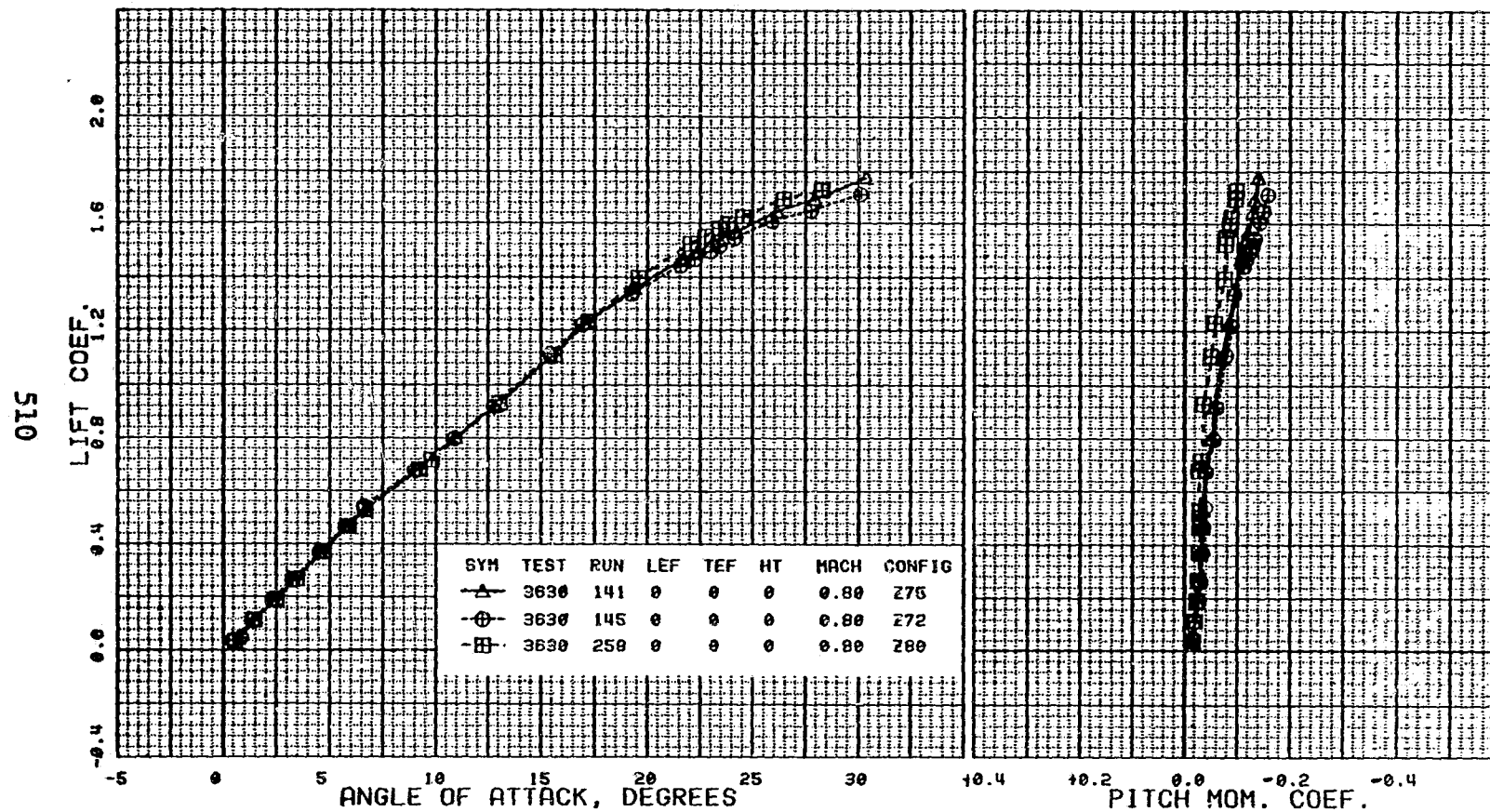


Figure 3-70 Effect Of Forebody Strake Size (Z72, Z75, Z80), YF-16+
30.5 Stretch, M = 0.80
(a) Lift and Pitching Moment

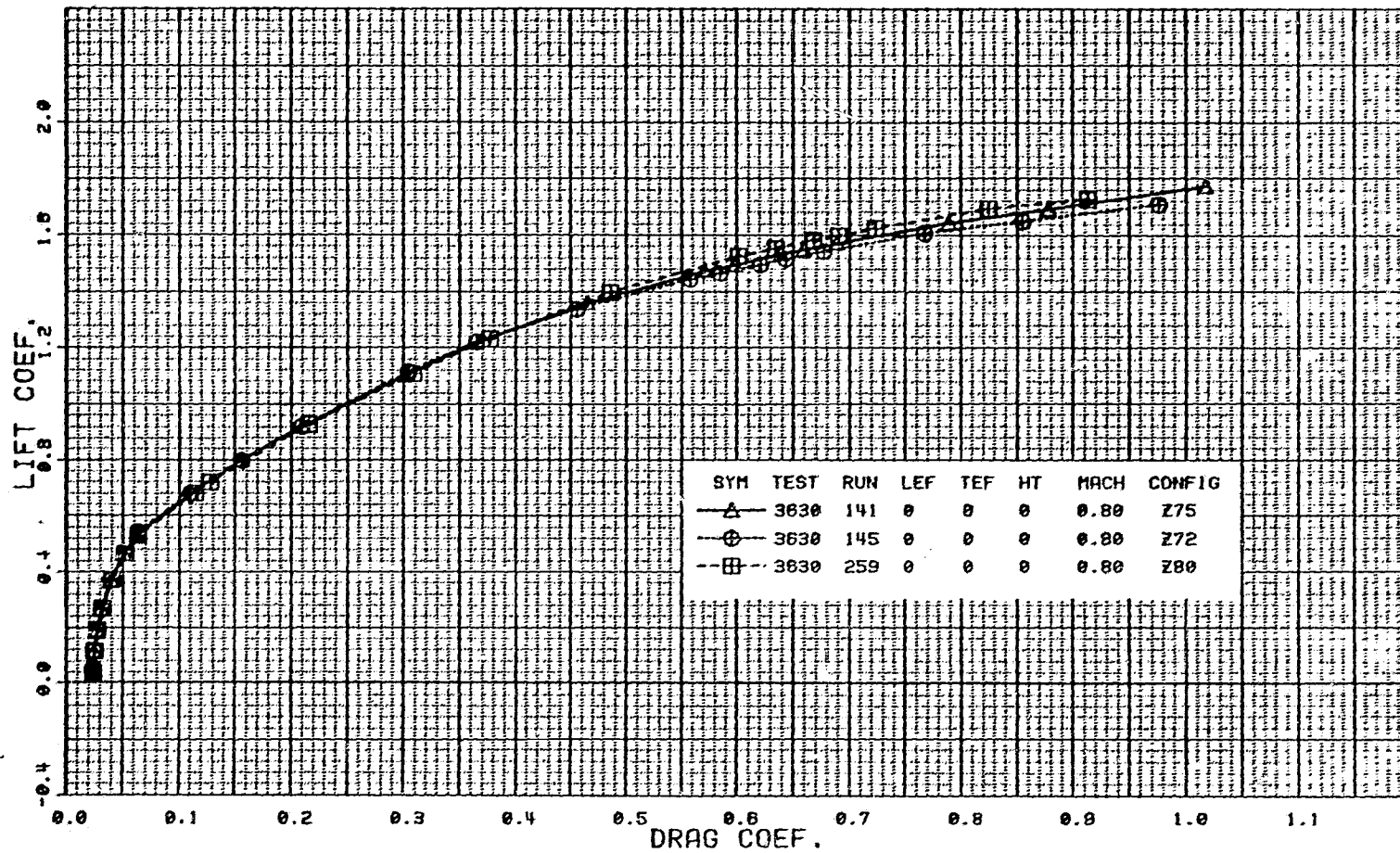


Figure 3-70 (b) Drag, Large Scale

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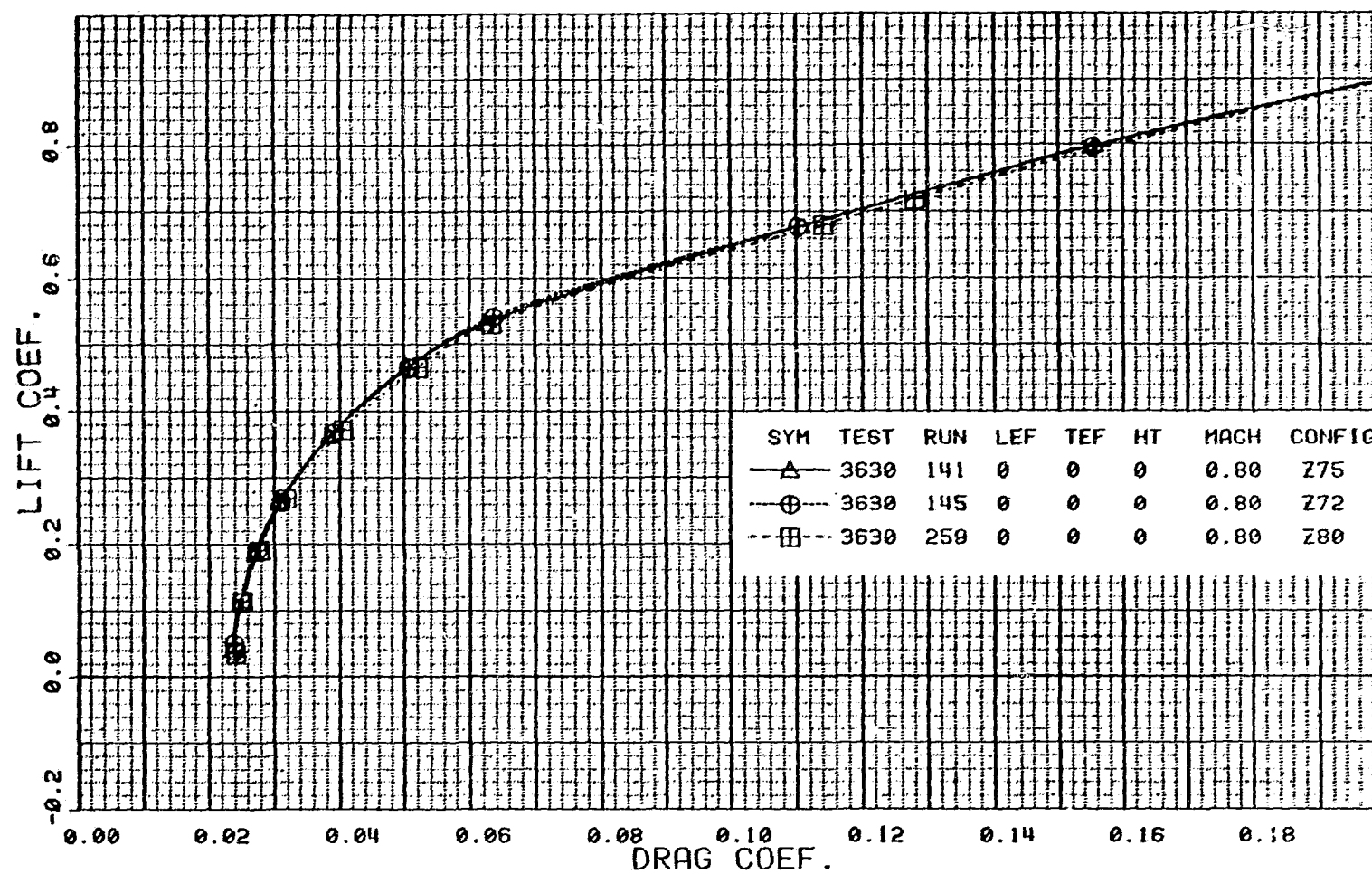


Figure 3-70 (c) Drag, Small Scale

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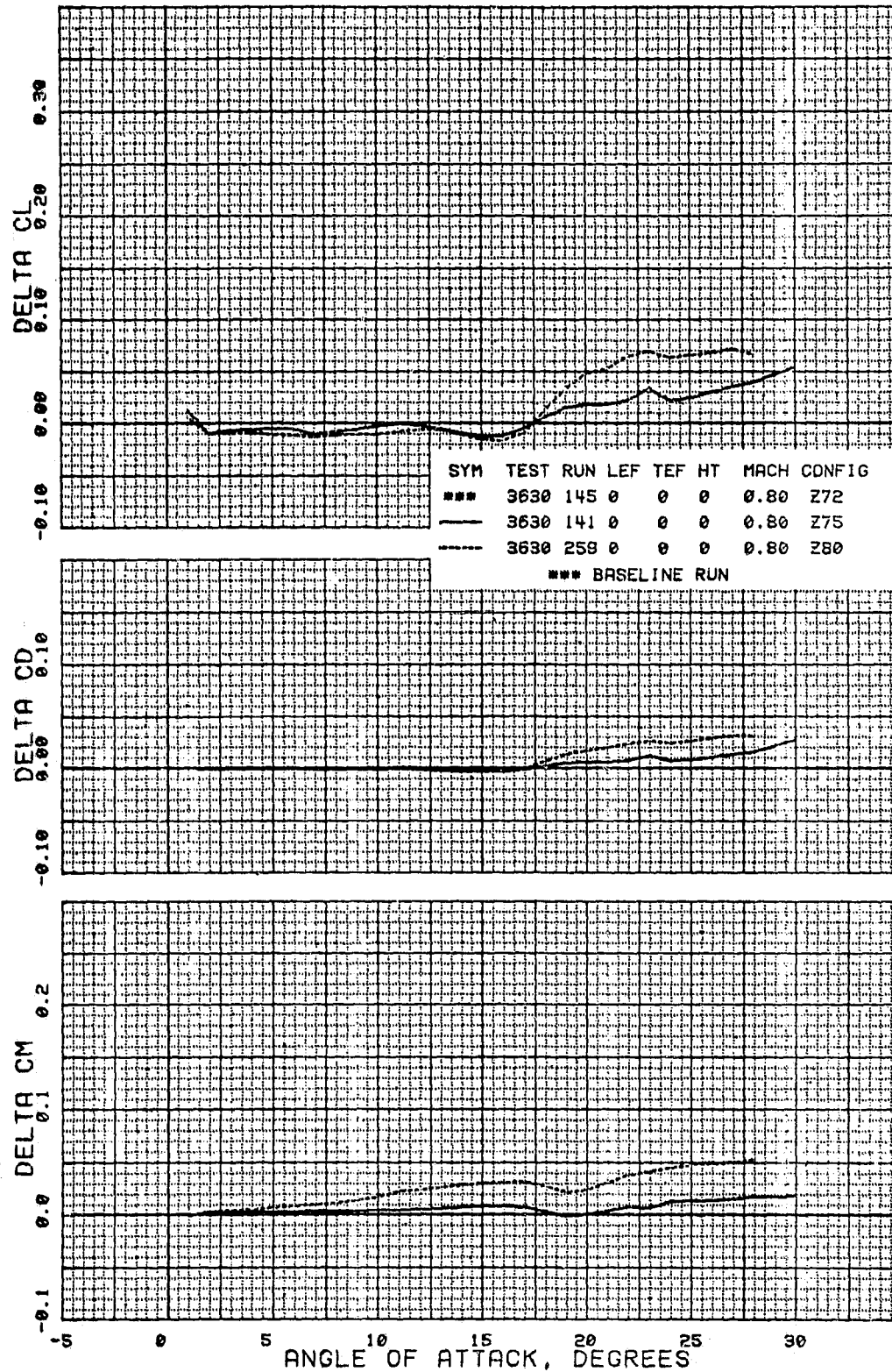


Figure 3-70 (d) Increments

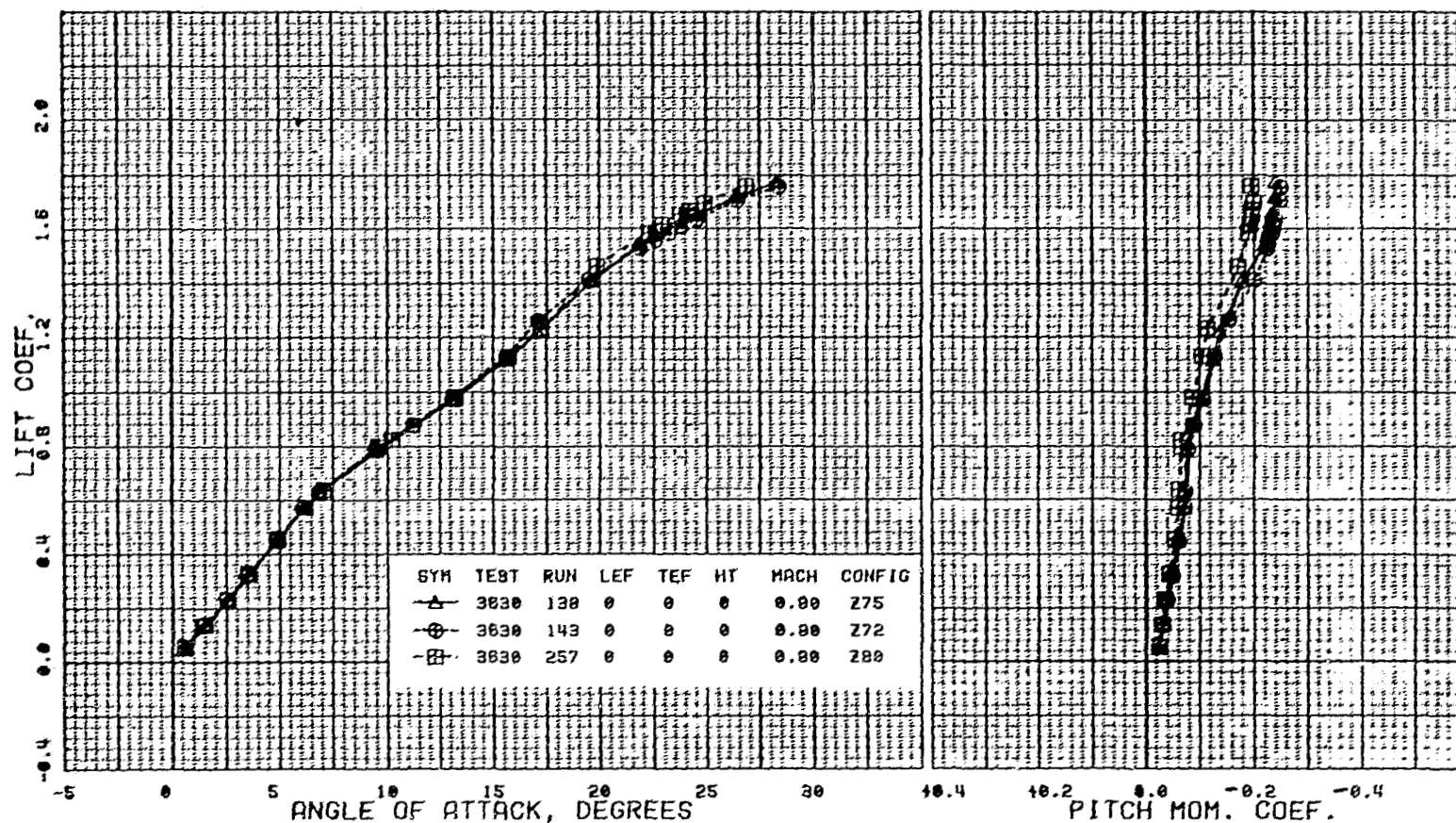


Figure 3-71 Effect of Forebody Strake Size (272,275,280) YF-16+
 30.5 Stretch LEF = 0, M = 0.90
 (a) Lift and Pitching Moment

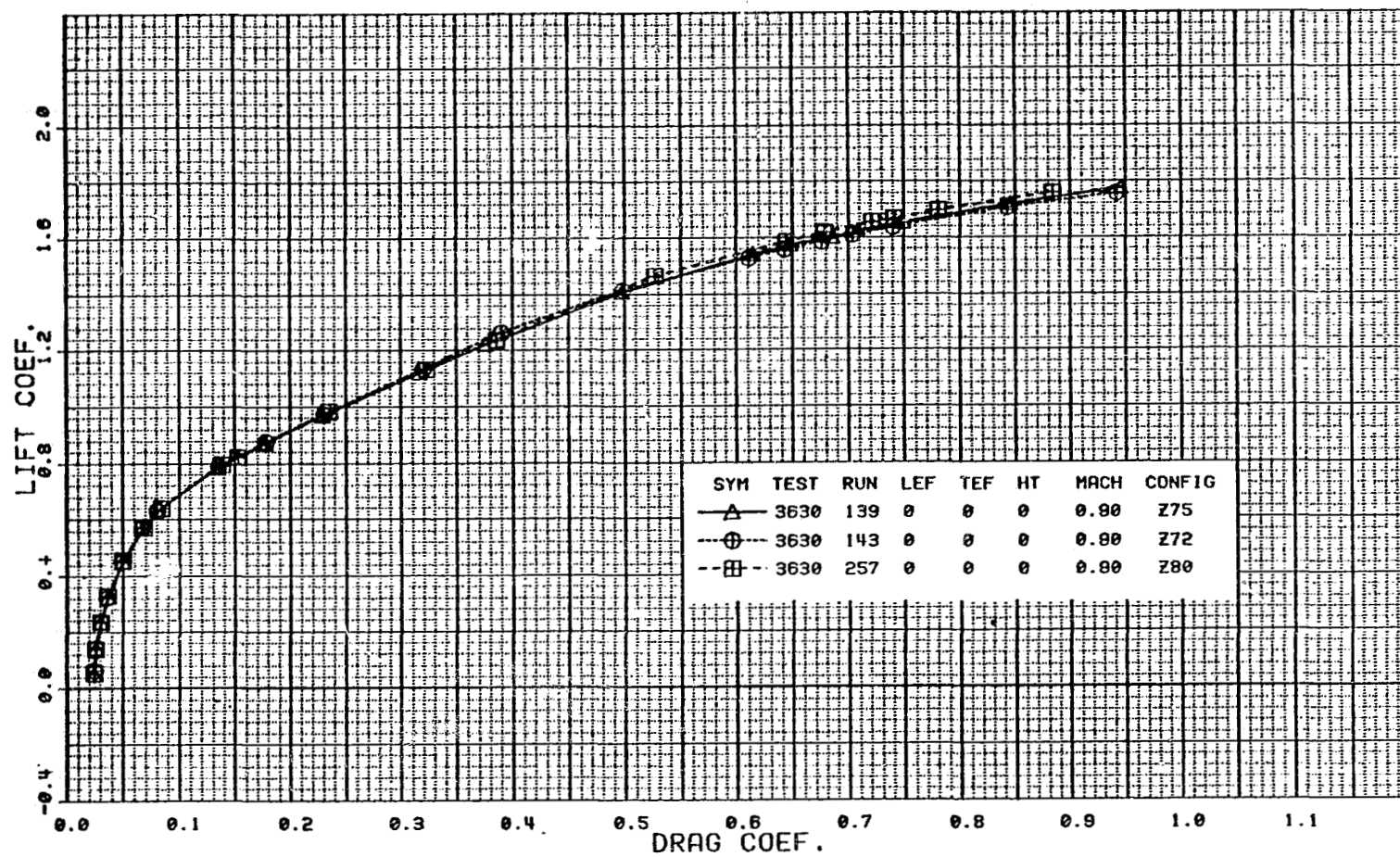


Figure 3-71 (b) Drag, Large Scale

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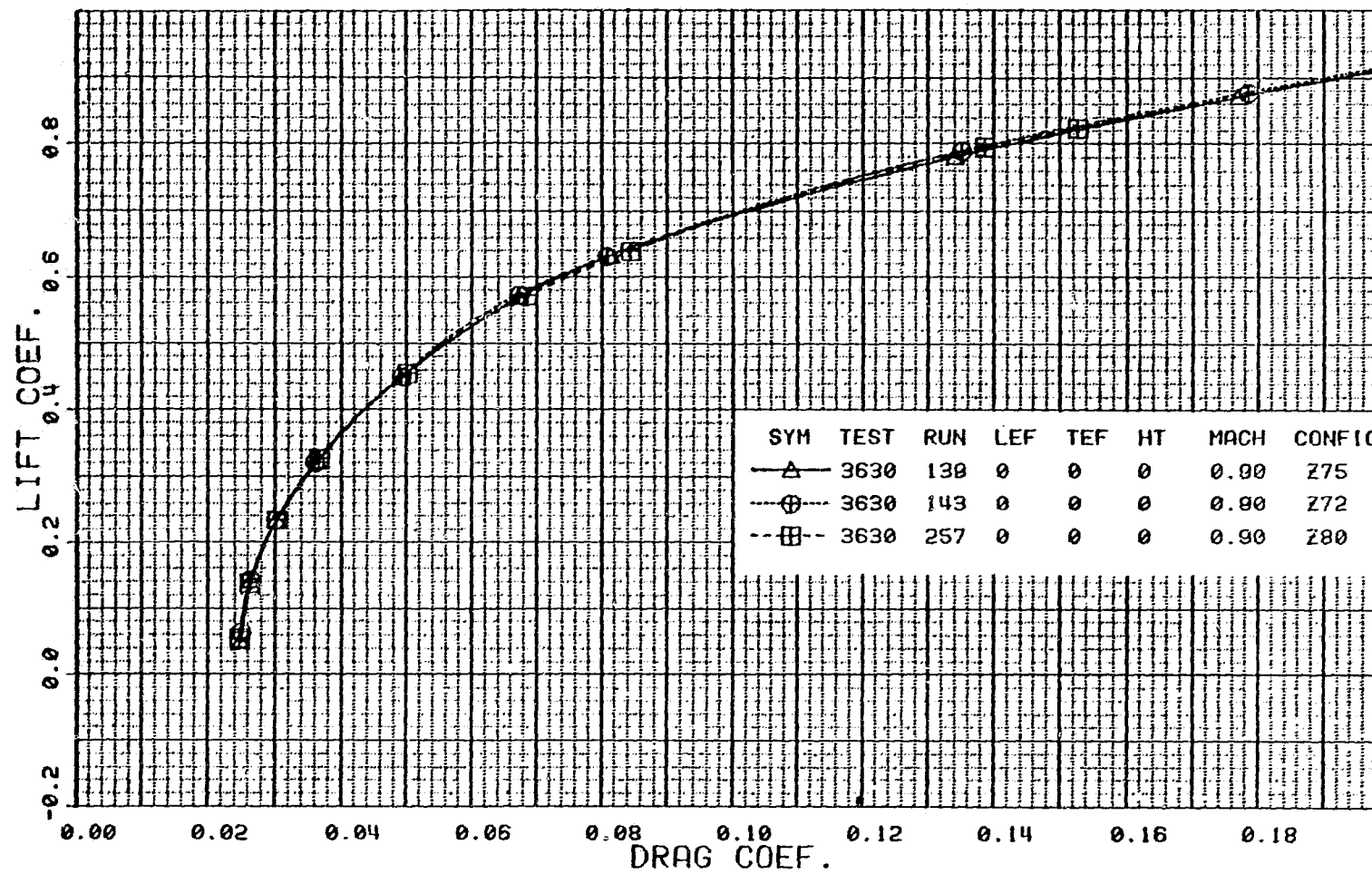


Figure 3-71 (c) Drag, Small Scale

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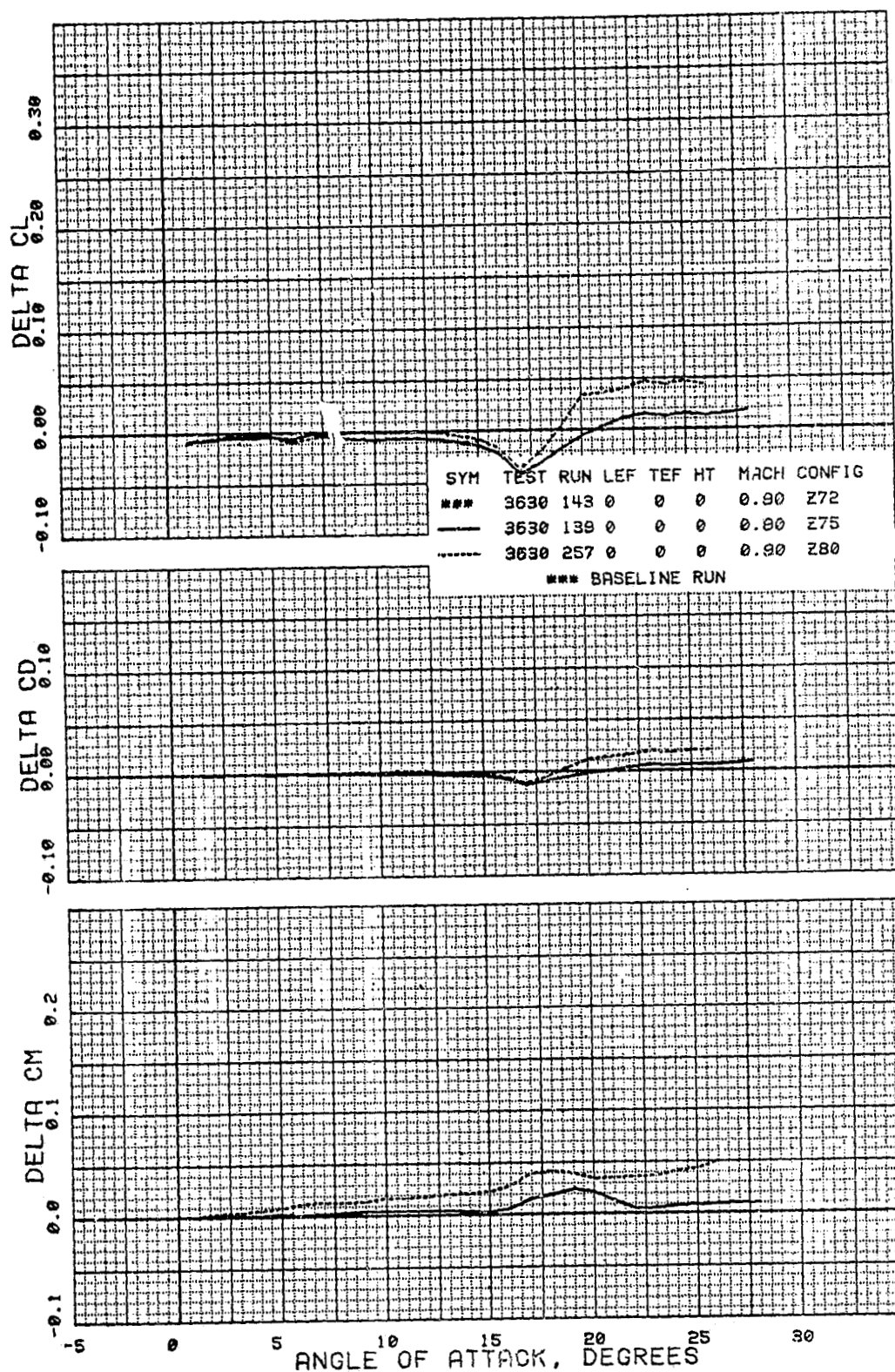


Figure 3-71 (d) Increments

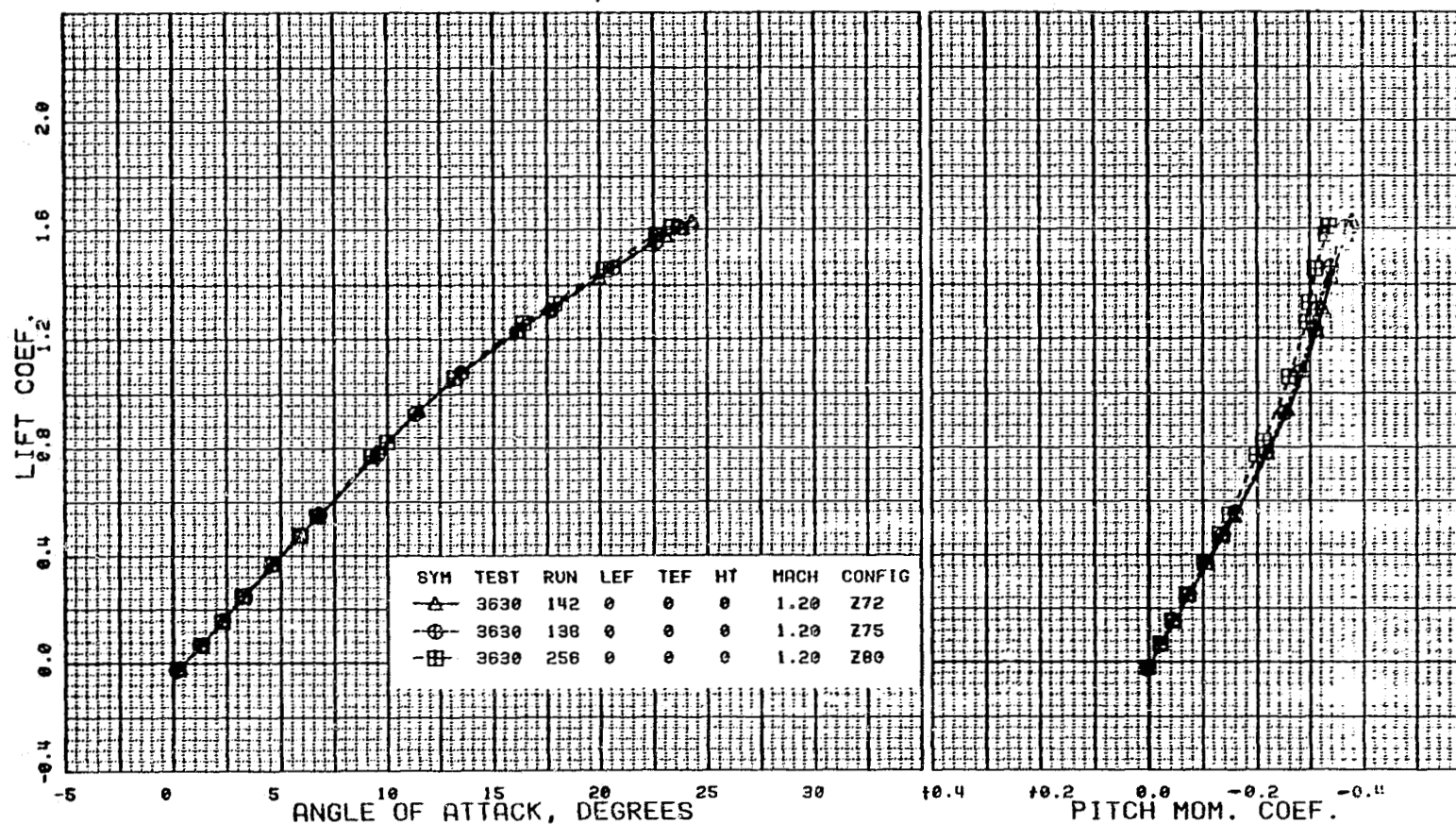


Figure 3-72 Effect of Forebody Strake Size (Z72,Z75,Z80) YF-16+
30.5 Stretch, $M = 1.20$
(a) Lift and Pitching Moment

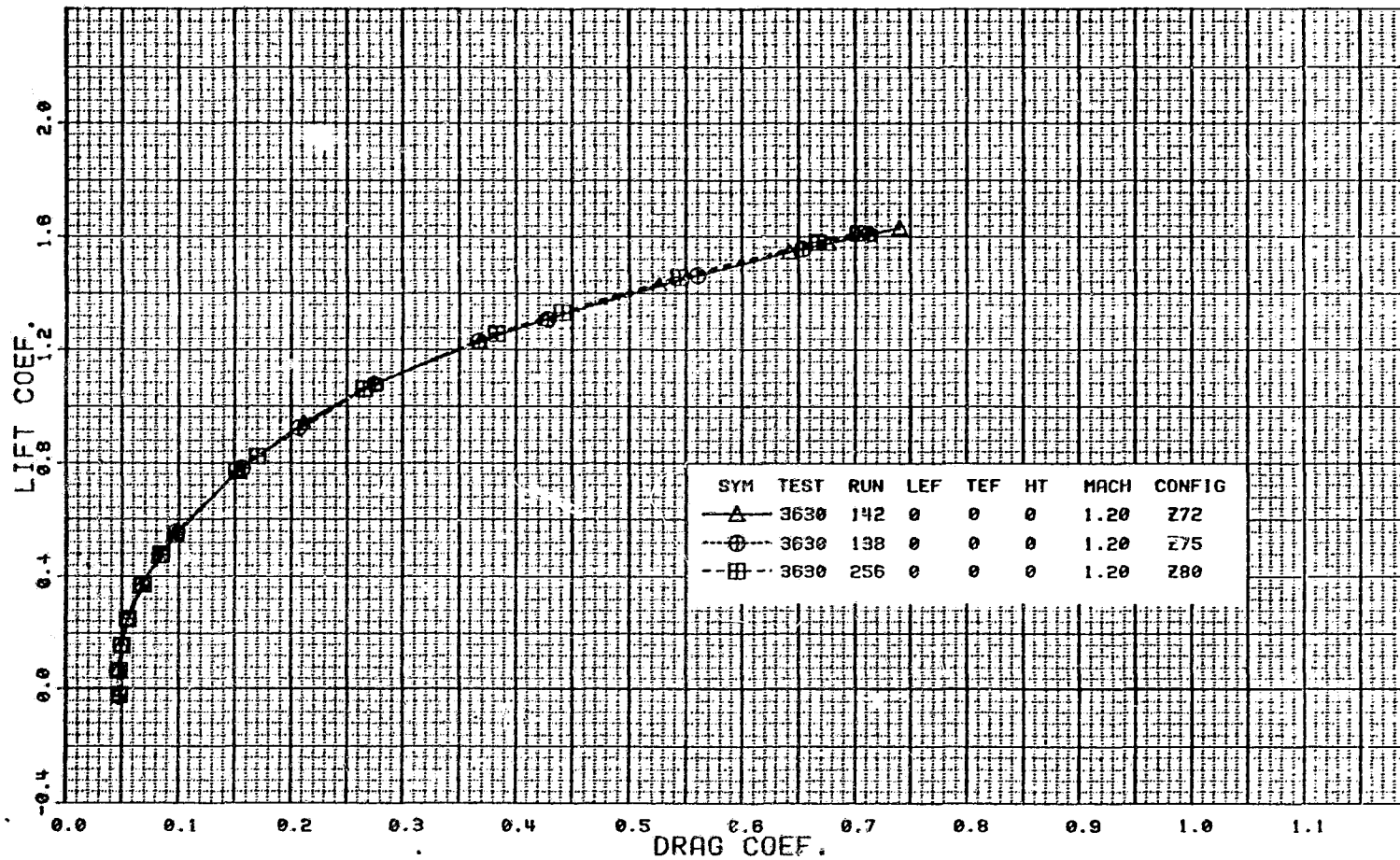


Figure 3-72 (b) Drag, Large Scale

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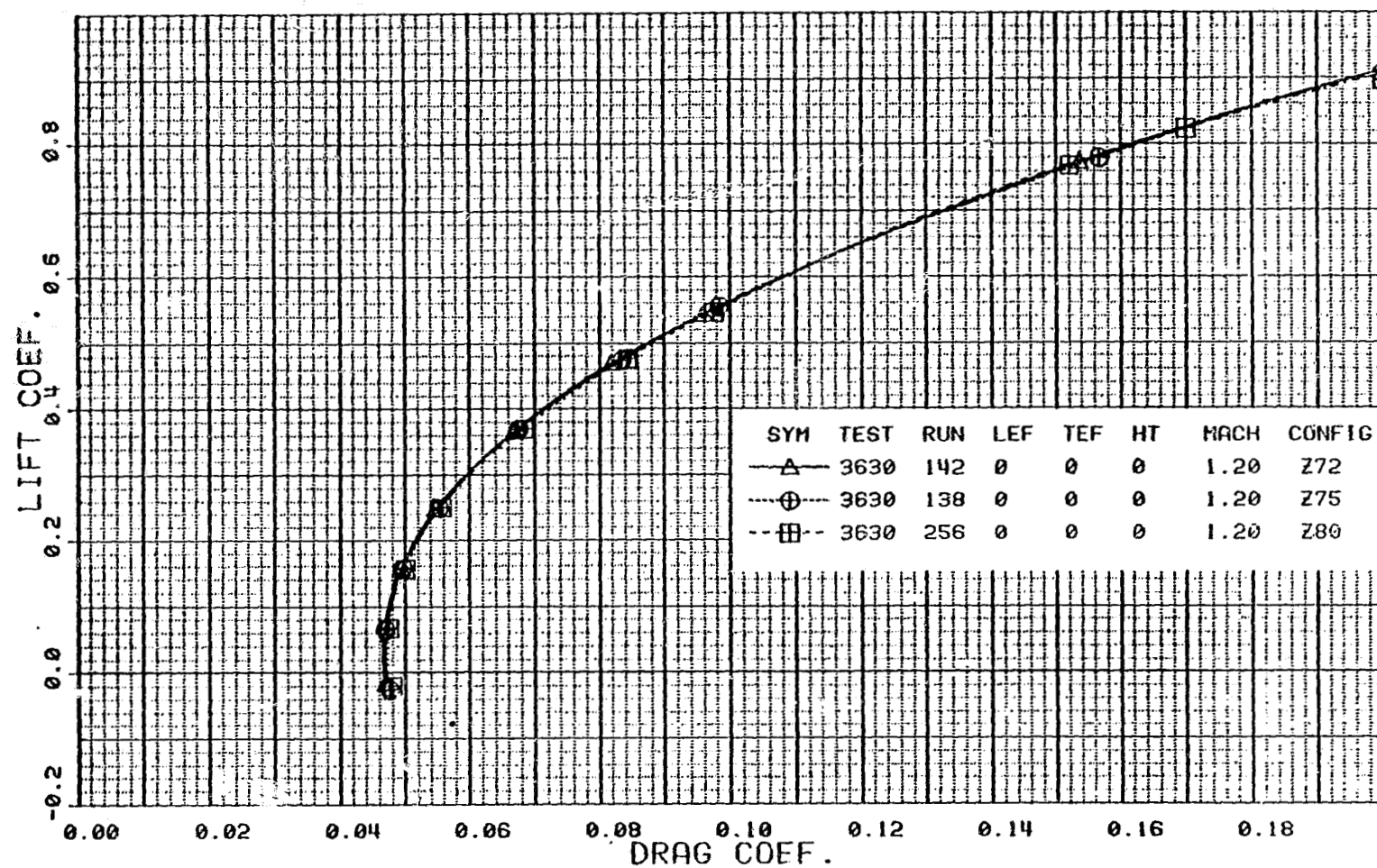


Figure 3-72 (c) Drag, Small Scale

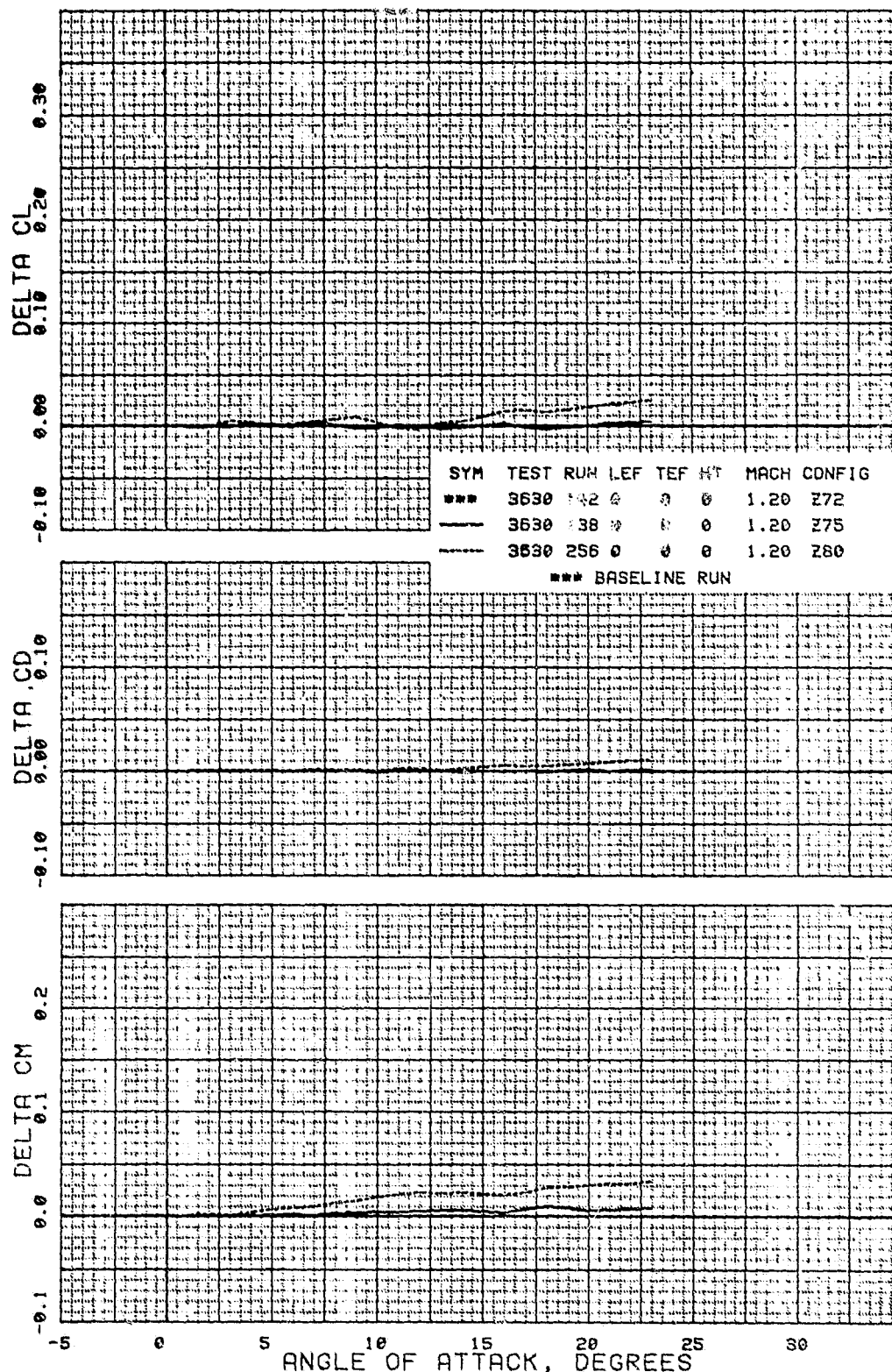


Figure 3-72 (d) Increments

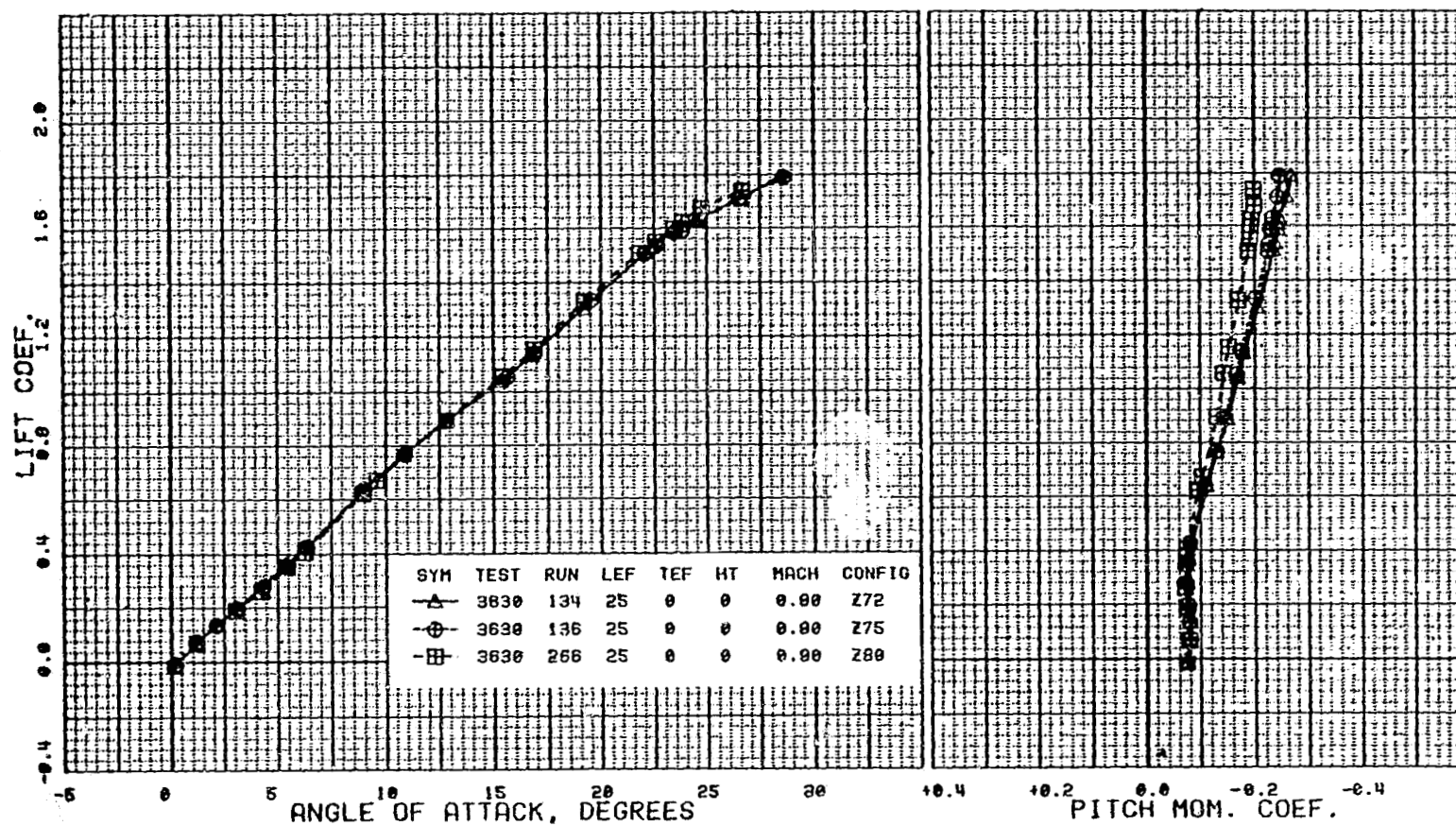


Figure 3-73 Effect of Forebody Strake Size (Z72,Z75,Z80), YF=16+30.5
 Stretch, LEF = 25°, M = 0.90
 (a) Lift and Pitching Moment

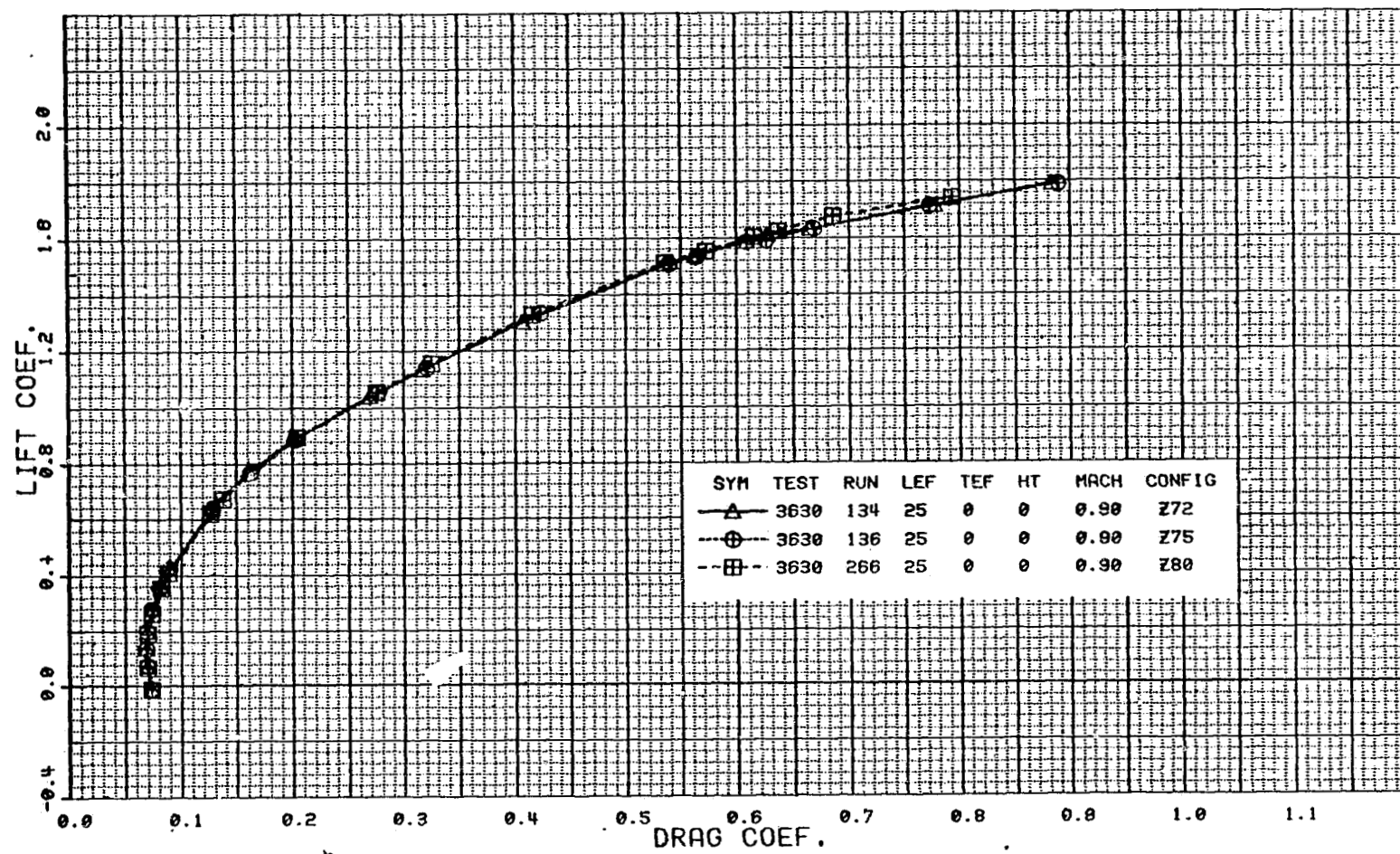


Figure 3-73 (b) Drag, Large Scale

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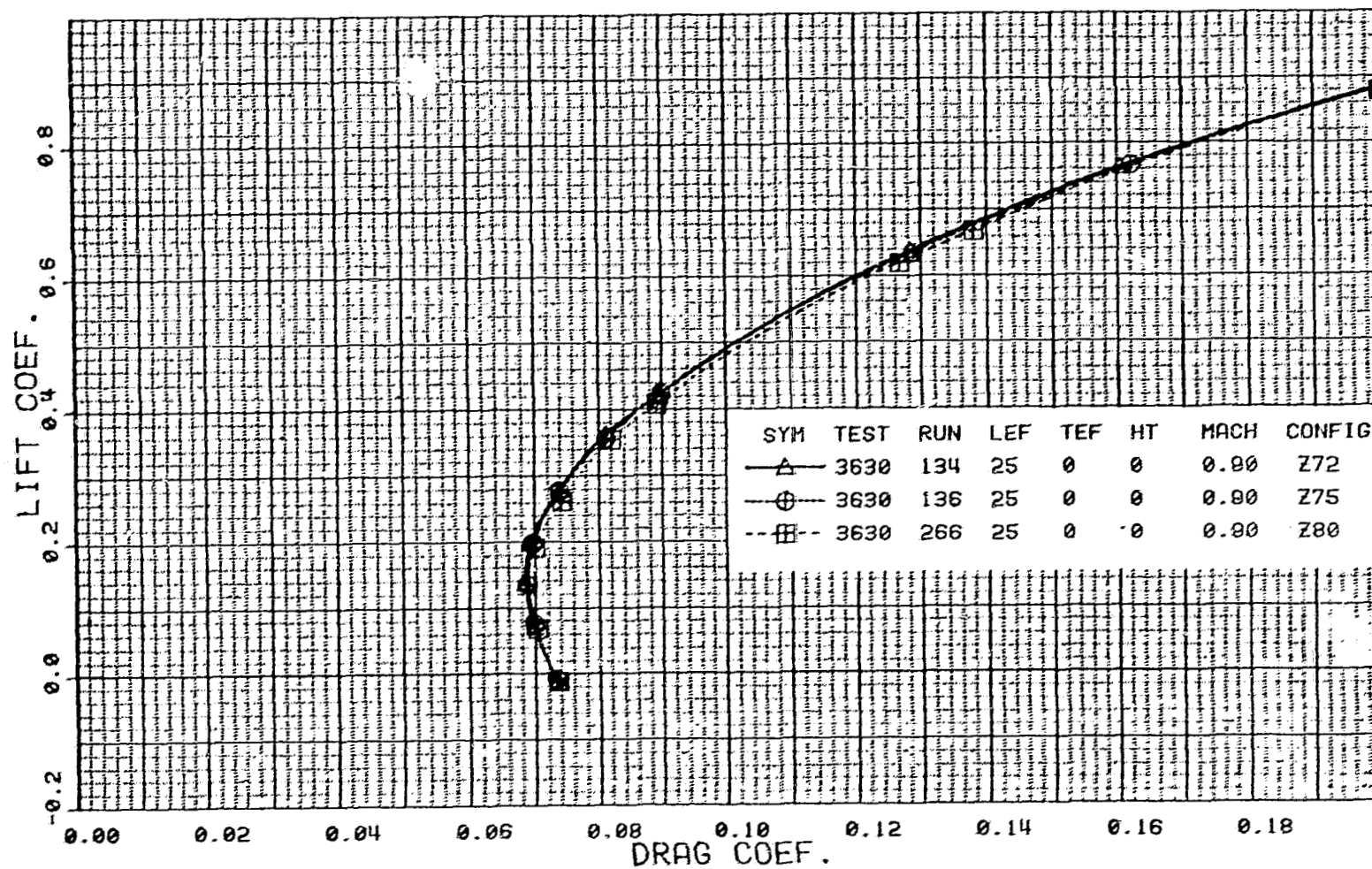


Figure 3-73 (c) Drag, Small Scale

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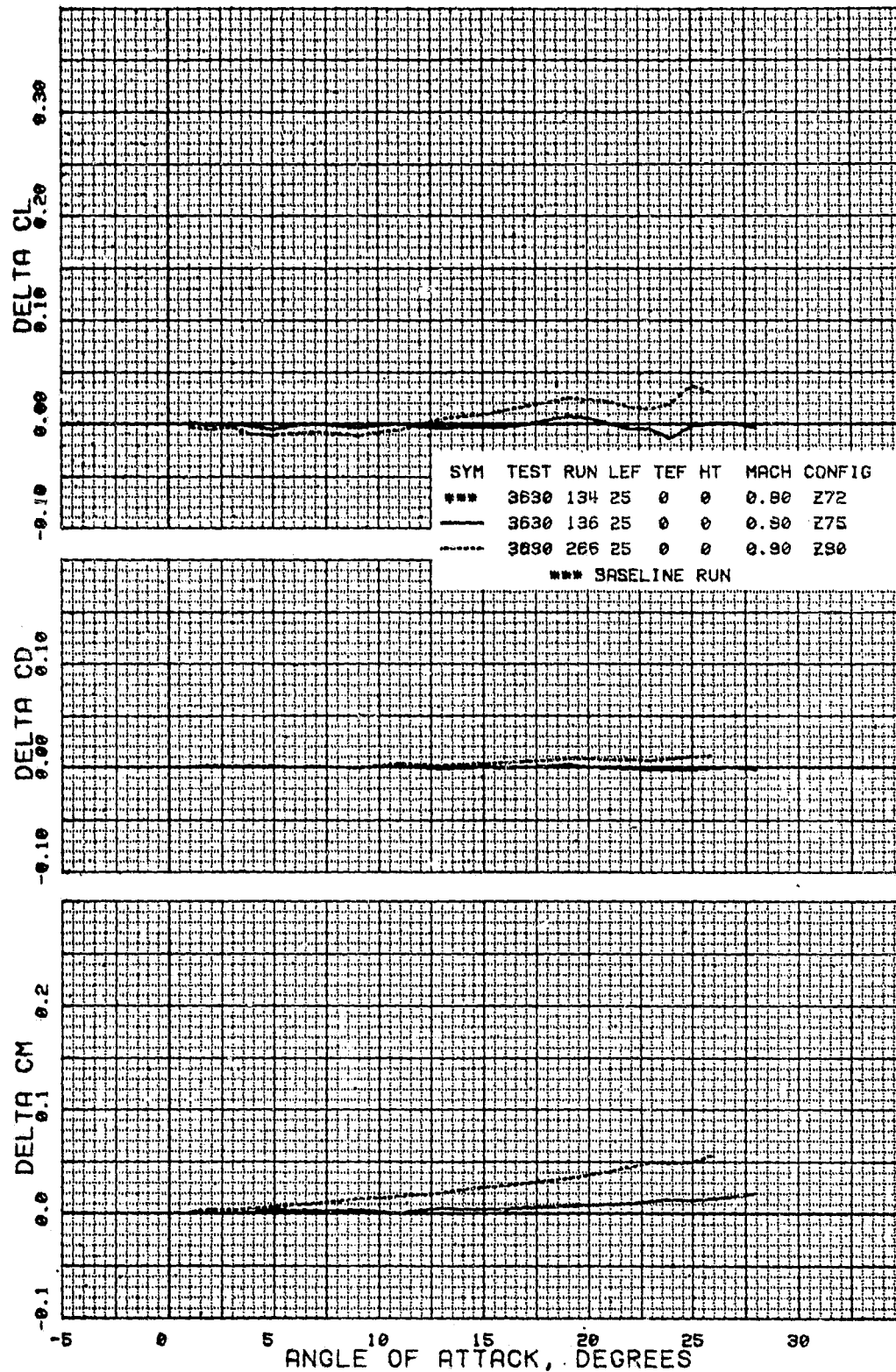


Figure 3-73 (d) Increments

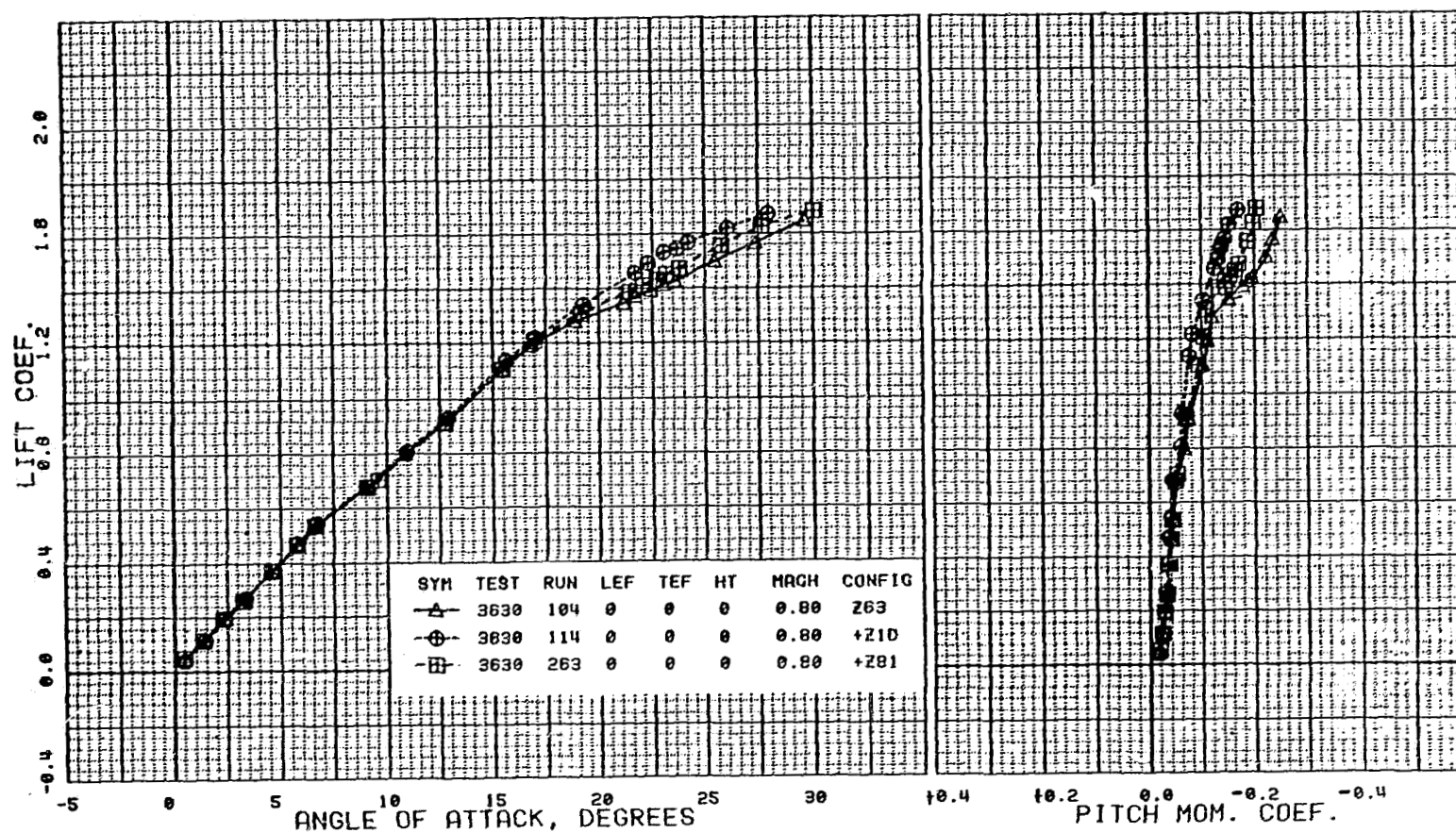


Figure 3-74 Effect of Canard Strakes Z1D and Z81, YF-16+00.5
 Stretch, $M = 0.80$
 (a) Lift and Pitching Moment

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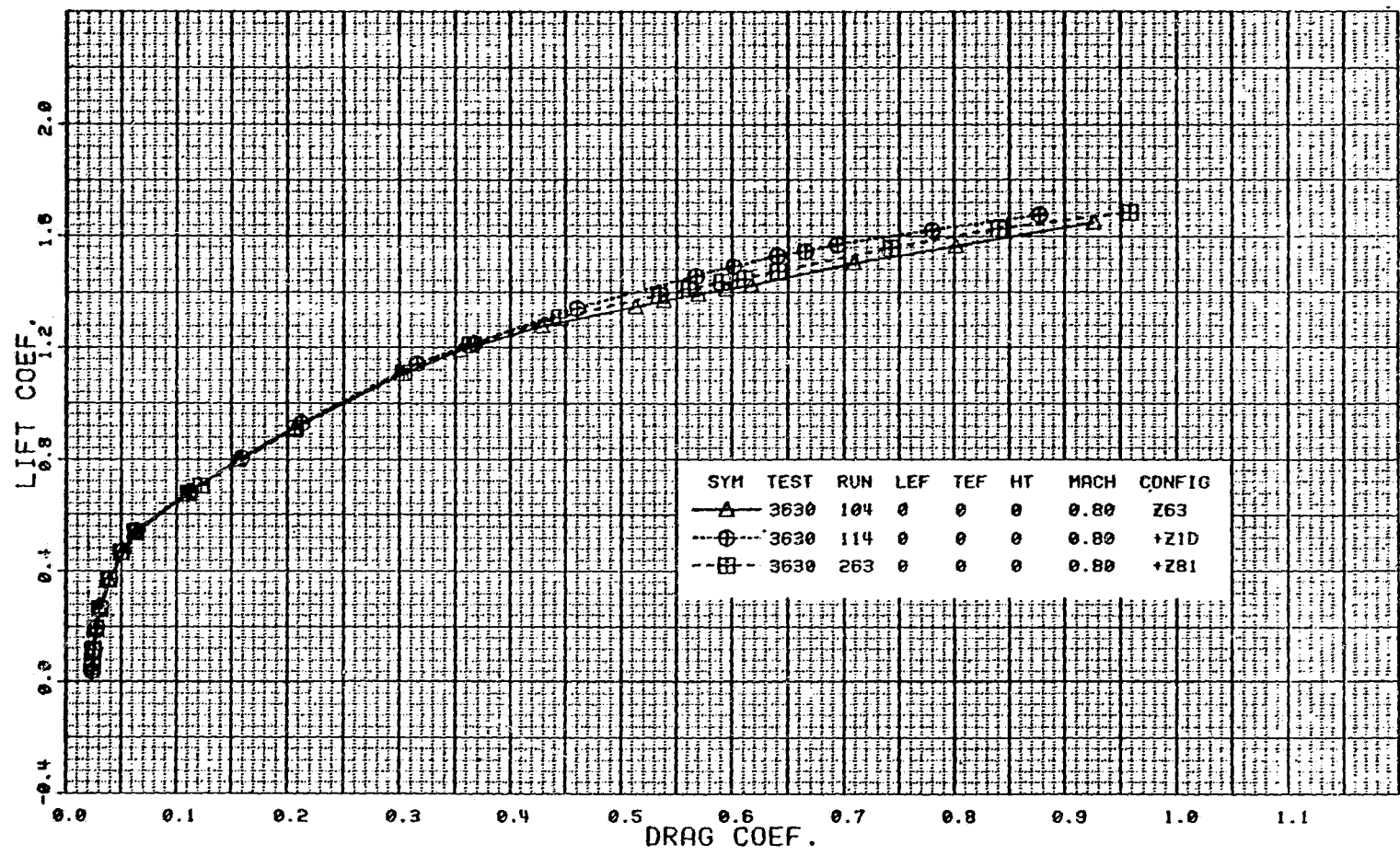


Figure 3-74 (b) Drag, Large Scale

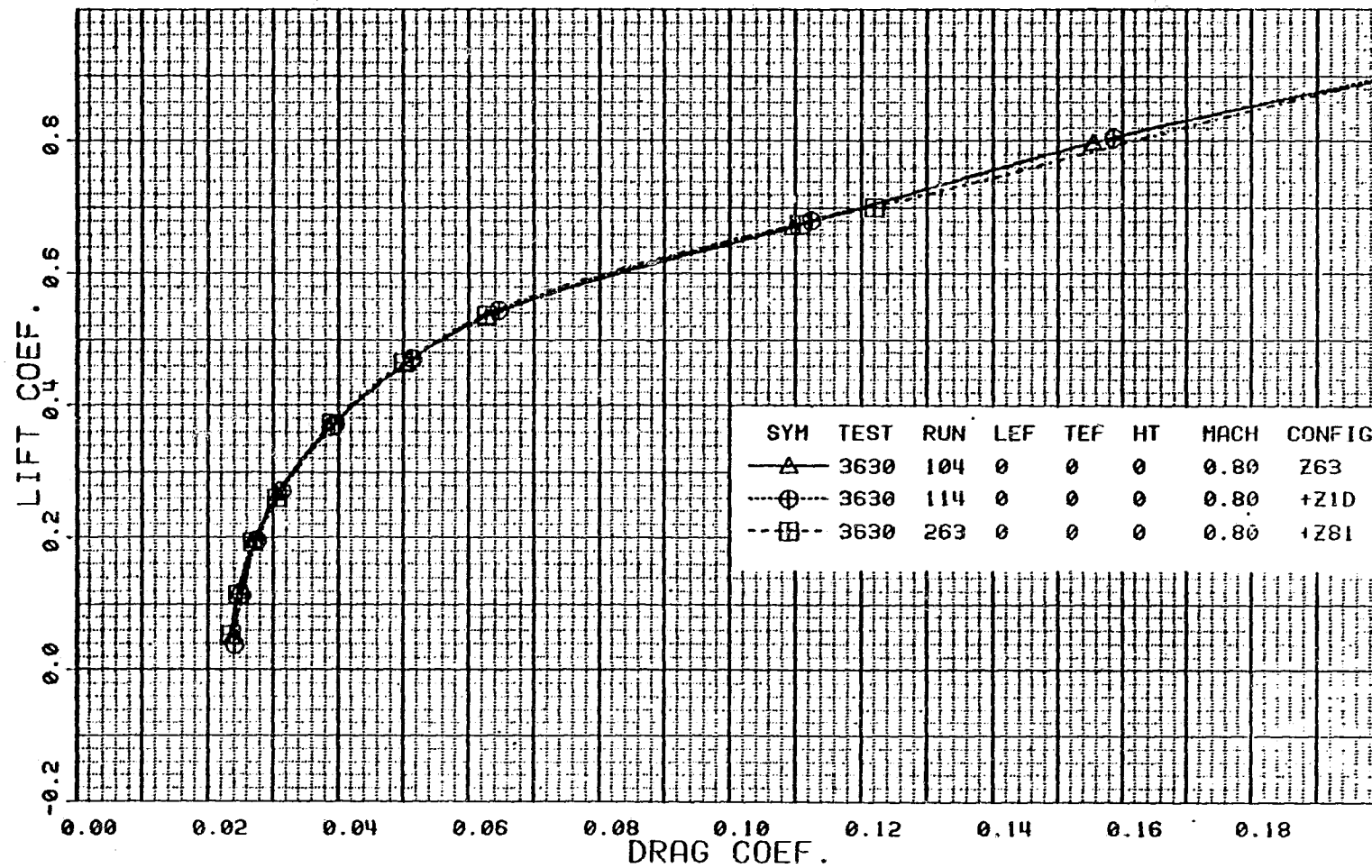


Figure 3-74 (c) Drag, Small Scale

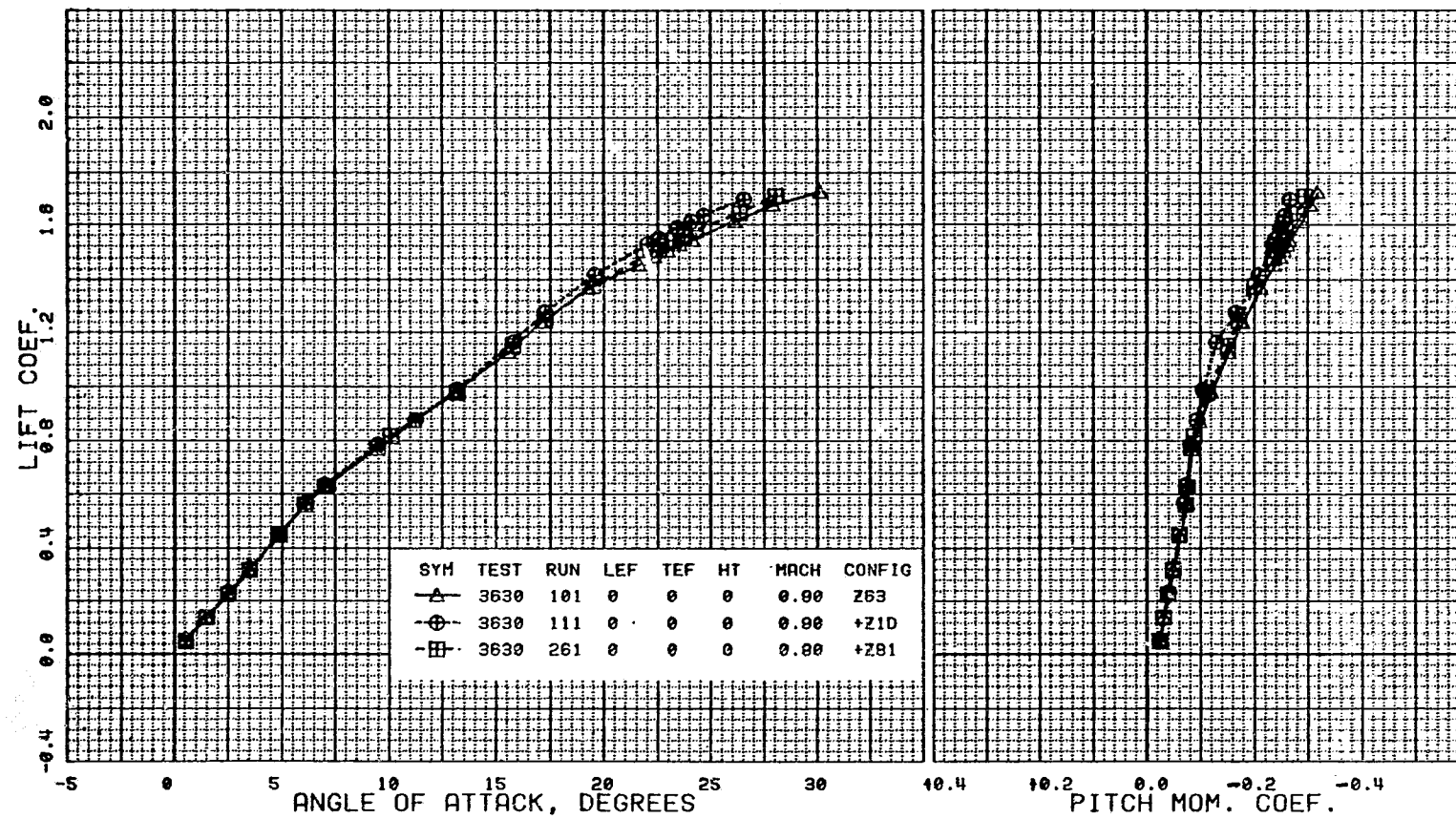


Figure 3-75 Effect of Canard Strakes Z1D and Z81, YF-16+30.5
 Stretch, LEF = 0, M = 0.90
 (a) Lift and Pitching Moment

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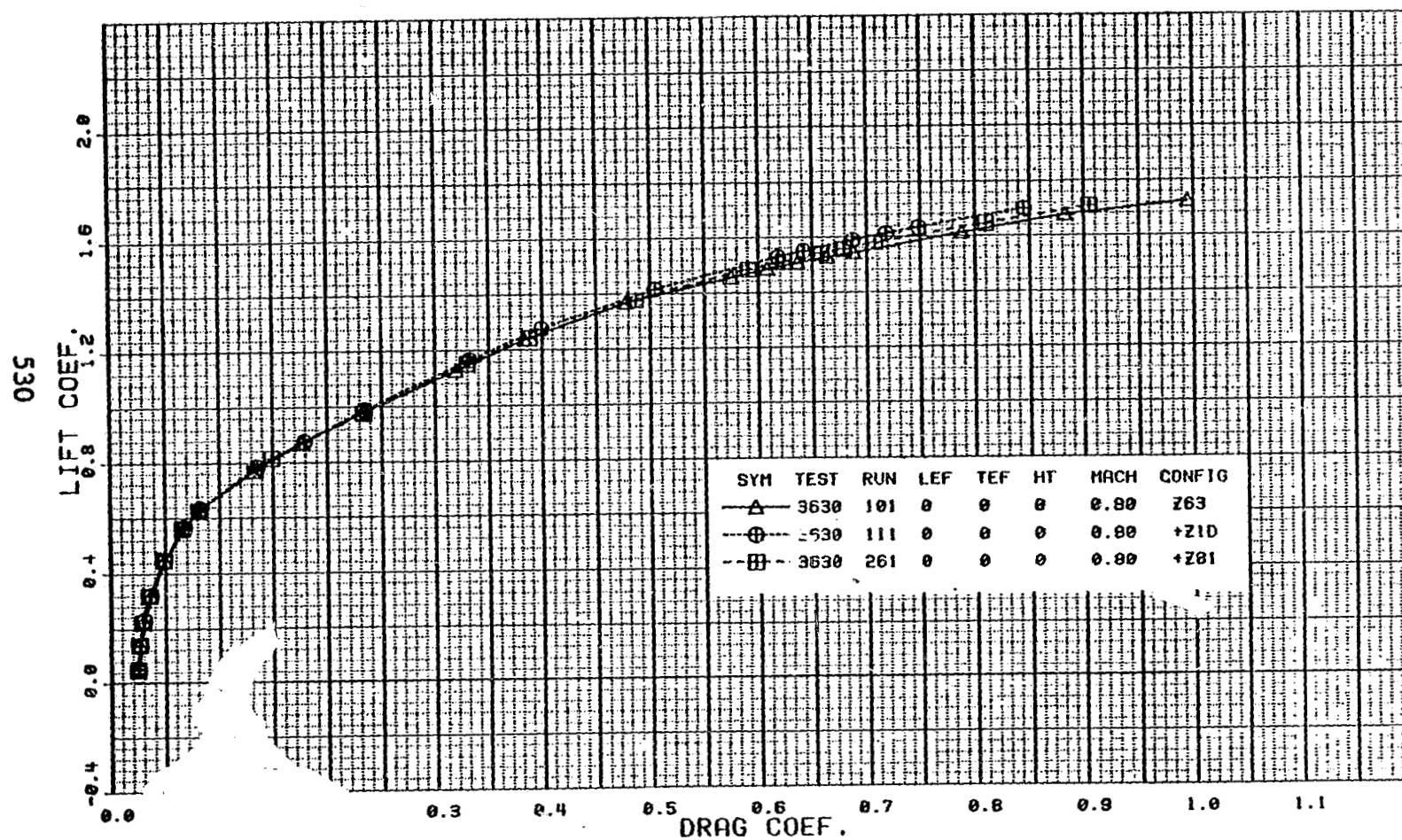


Figure 3-75 (b) Drag, Large Scale

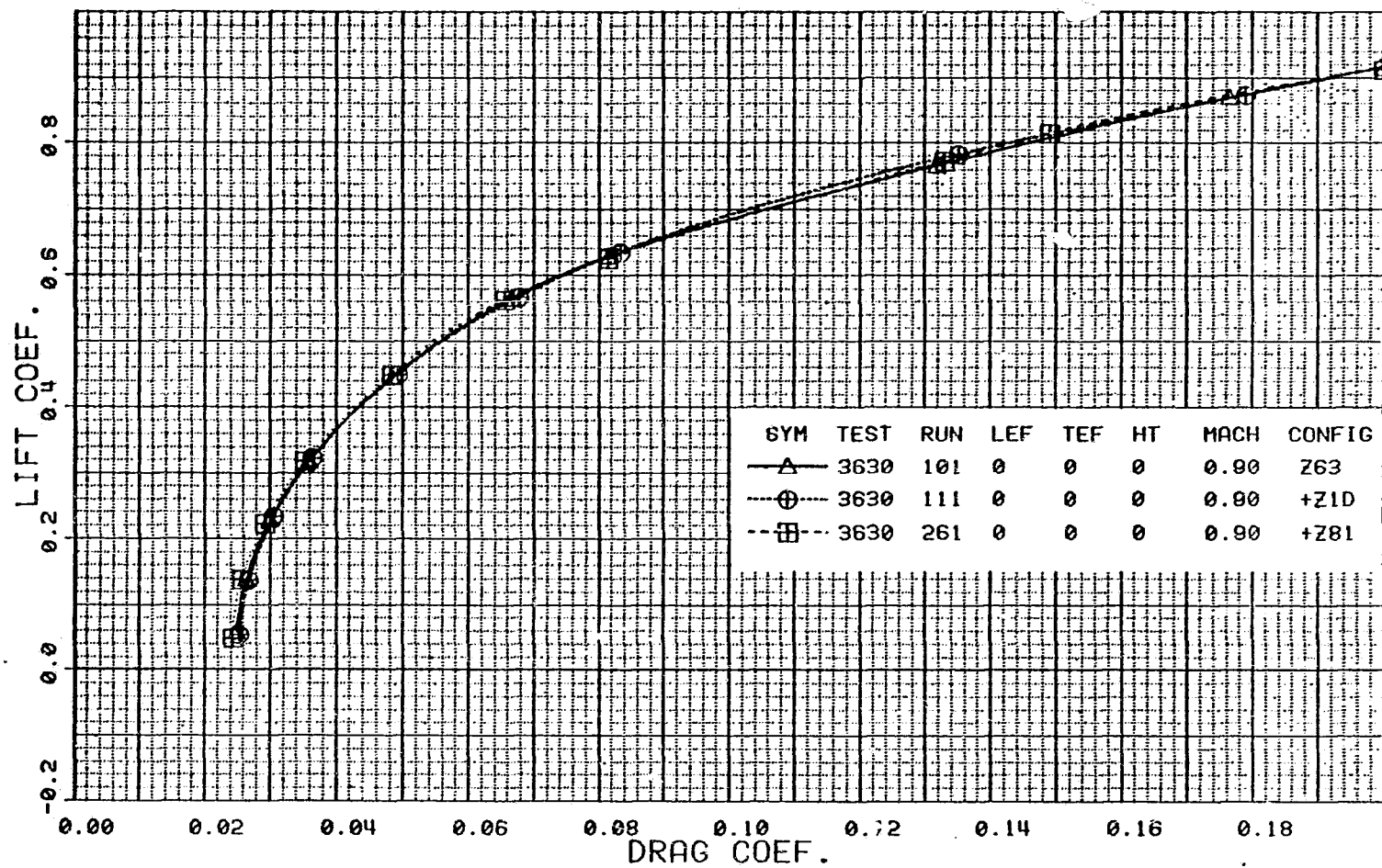


Figure 3-75 (c) Drag, Small Scale

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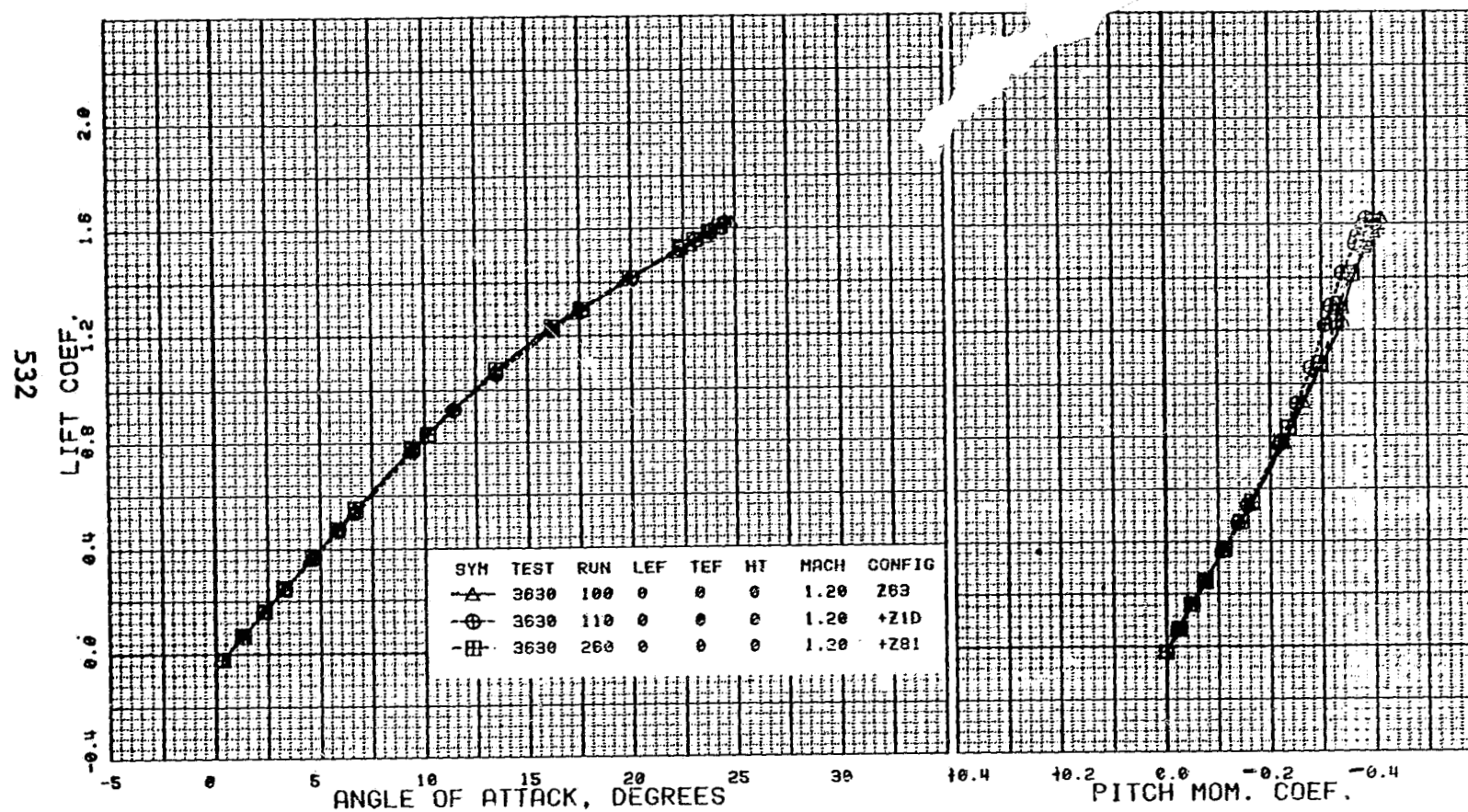


Figure 3-76 Effect of Canard Strakes Z1D and Z81, YF-16+30.5
Stretch, M = 1.20
(a) Lift and Pitching Moment

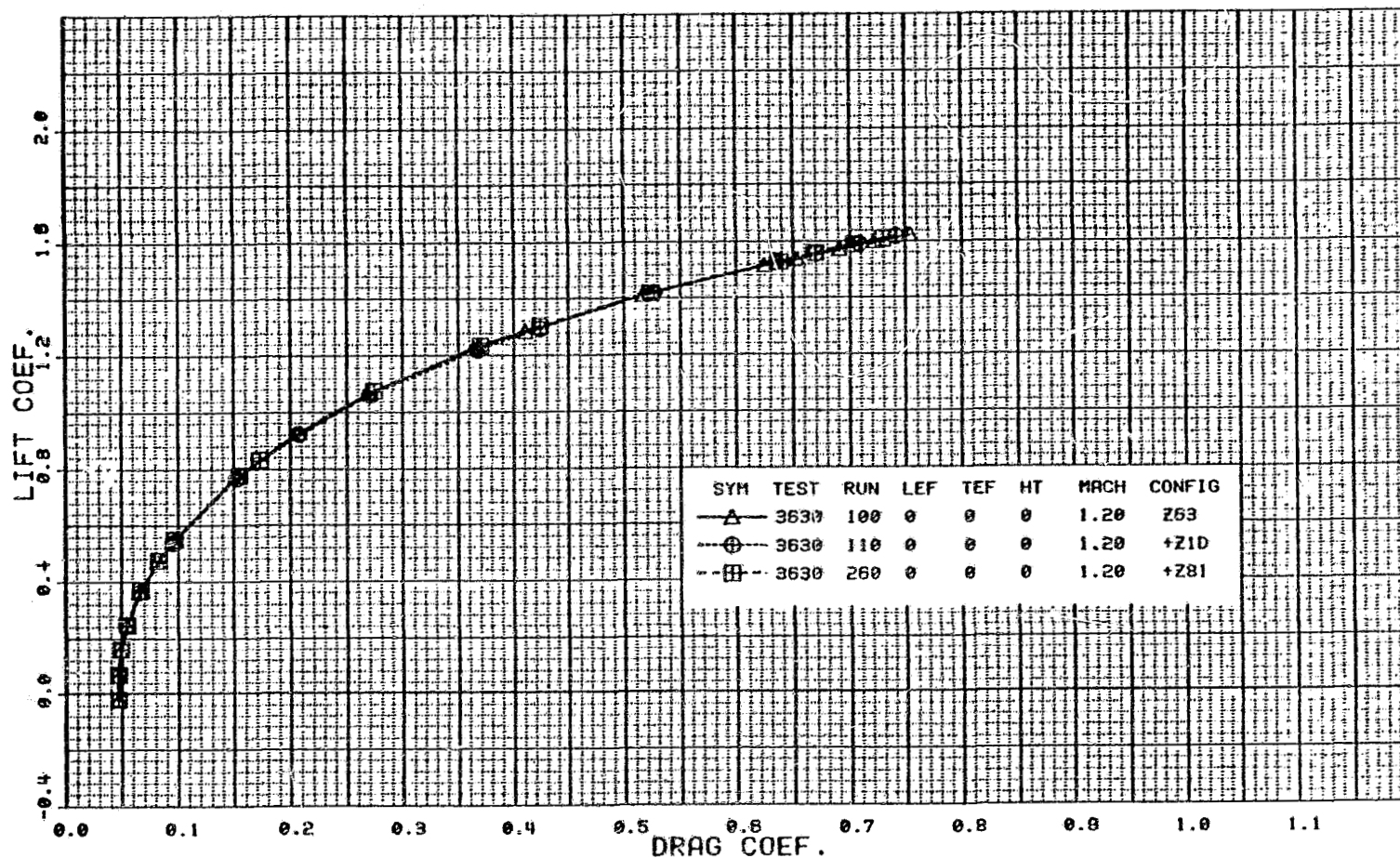


Figure 3-76 (b) Drag, Large Scale

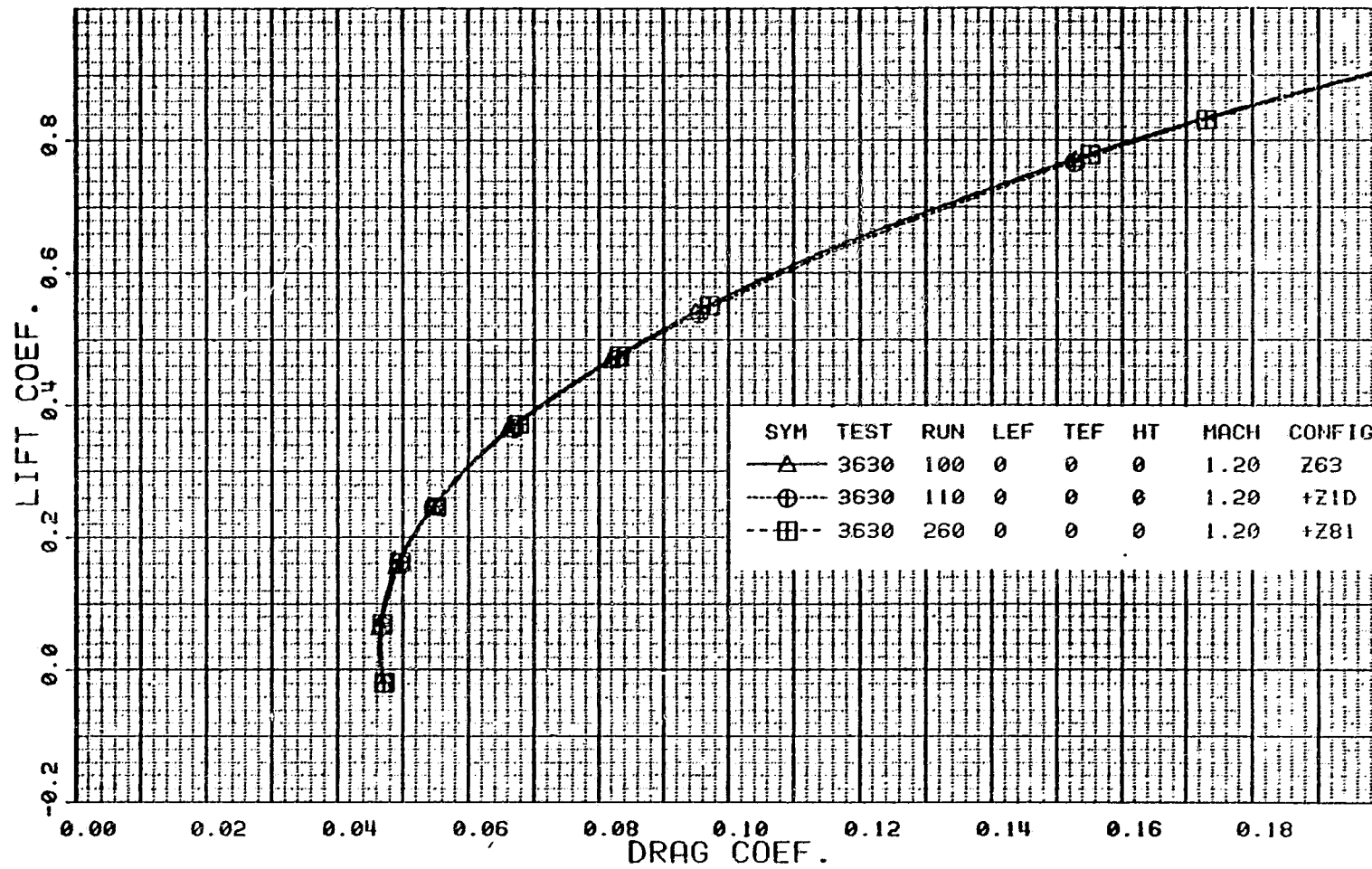


Figure 3-76 (c) Drag, Small Scale

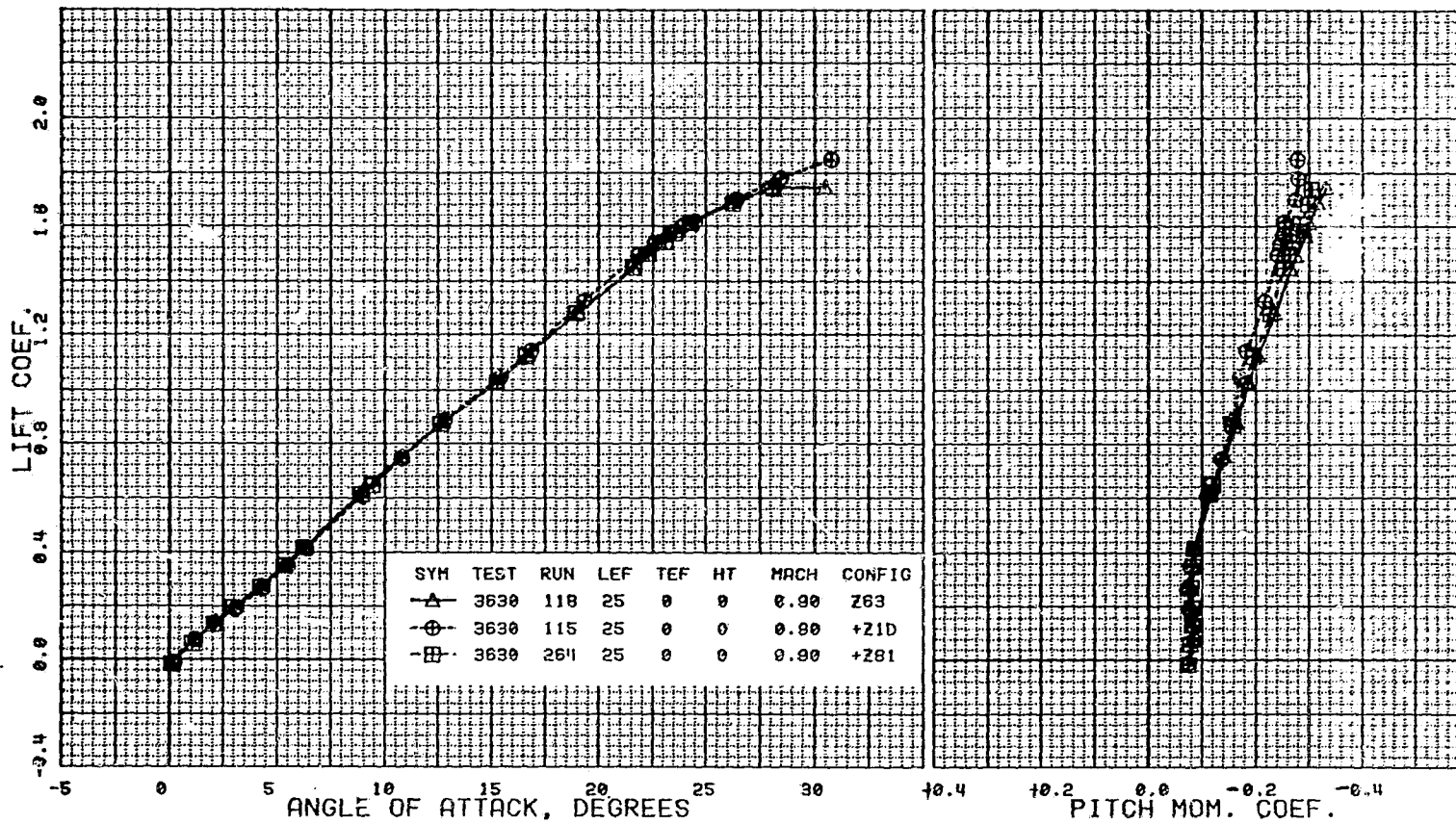


Figure 3-77 Effect of Canard Strakes Z1D and Z81, VF-16+30.5 Stretch,
 LEF=25°, M = 0.90
 (a) Lift and Pitching Moment

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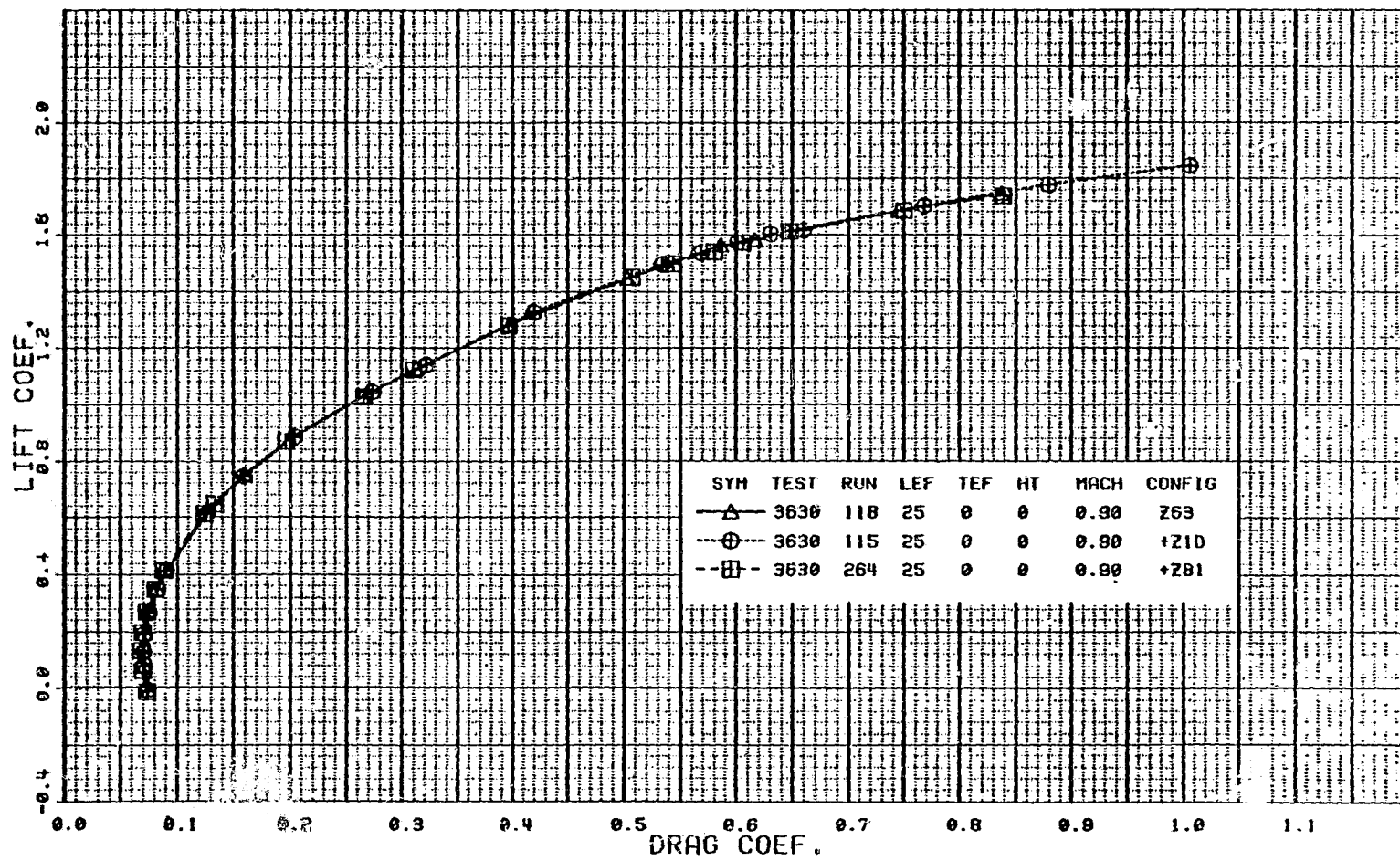


Figure 3-77 (b) Drag, Large Scale

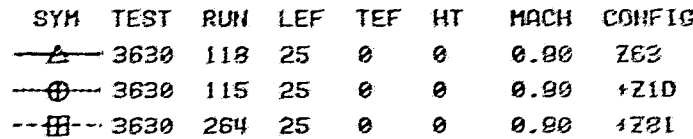


Figure 3-77 (c) Drag, Small Scale

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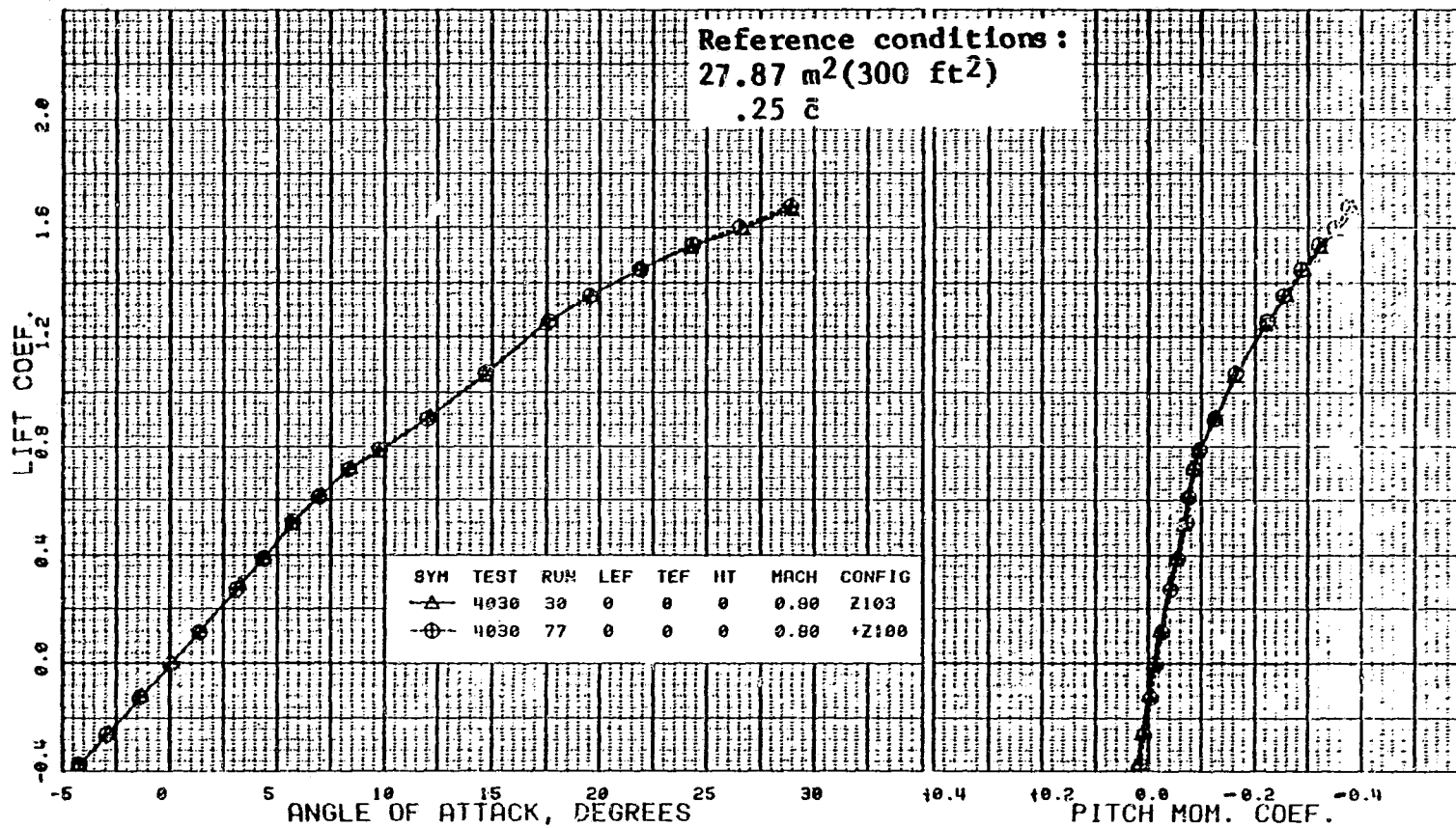


Figure 3-78 Effect of Nose Strake Z100, F-16, $M = 0.90$
 (a) Lift and Pitching Moment

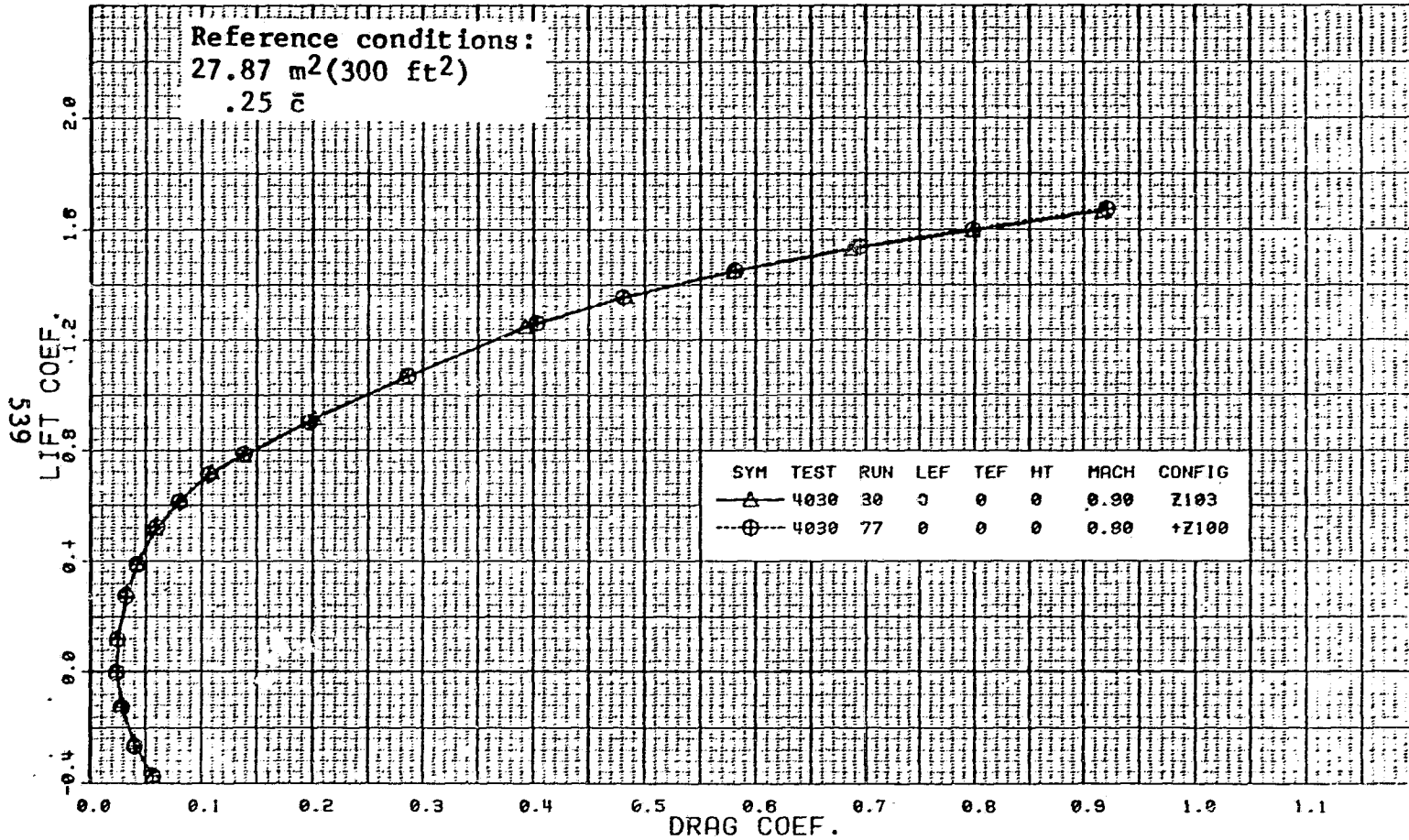


Figure 3-78 (b) Drag, Large Scale

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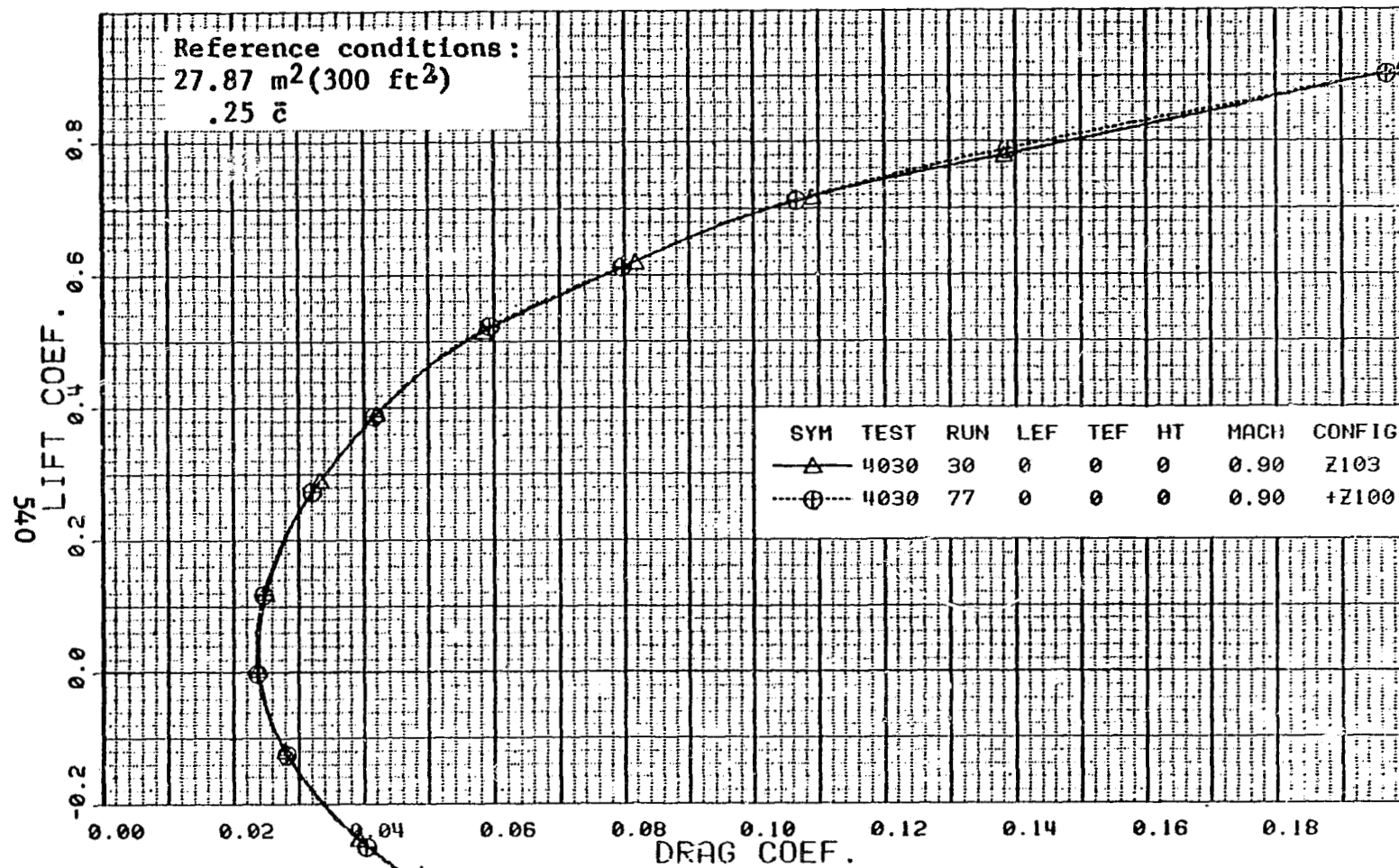


Figure 3-78 (c) Drag, Small Scale

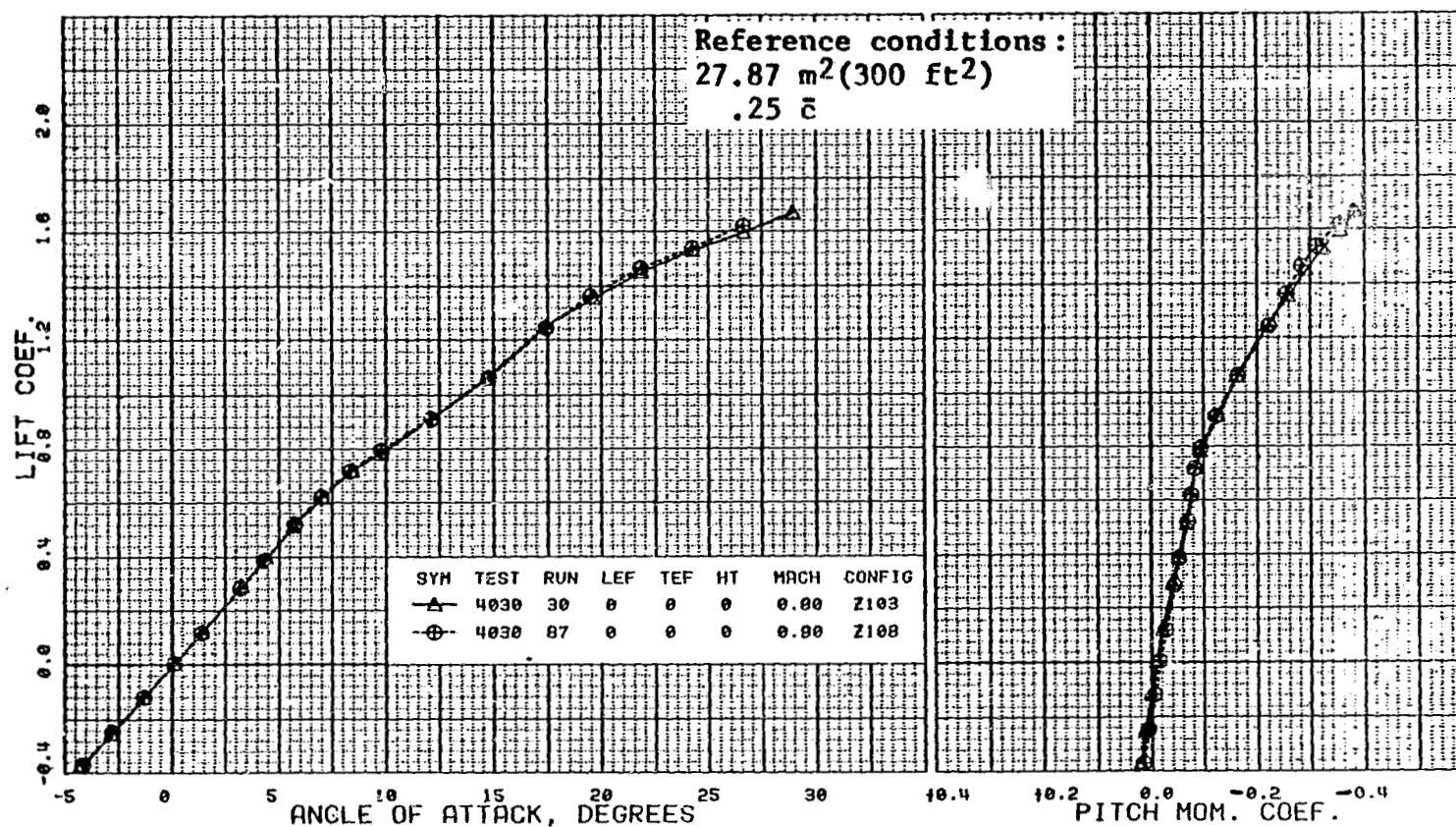


Figure 3-79 Effect of Forebody Strake Shape (Z103,Z108), F-16, $M = 0.90$
 (a) Lift and Pitching Moment

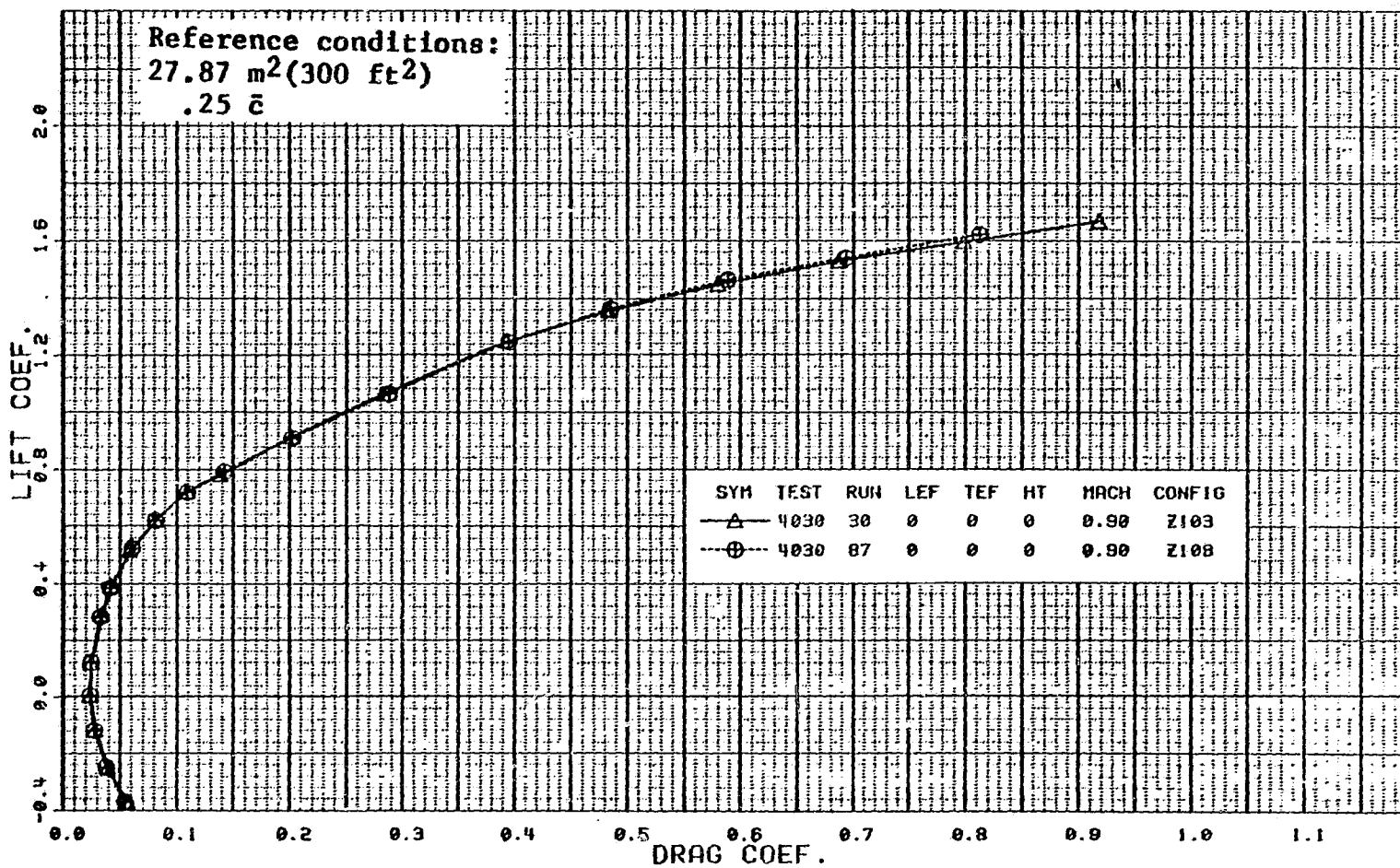


Figure 3-79 (b) Drag, Large Scale

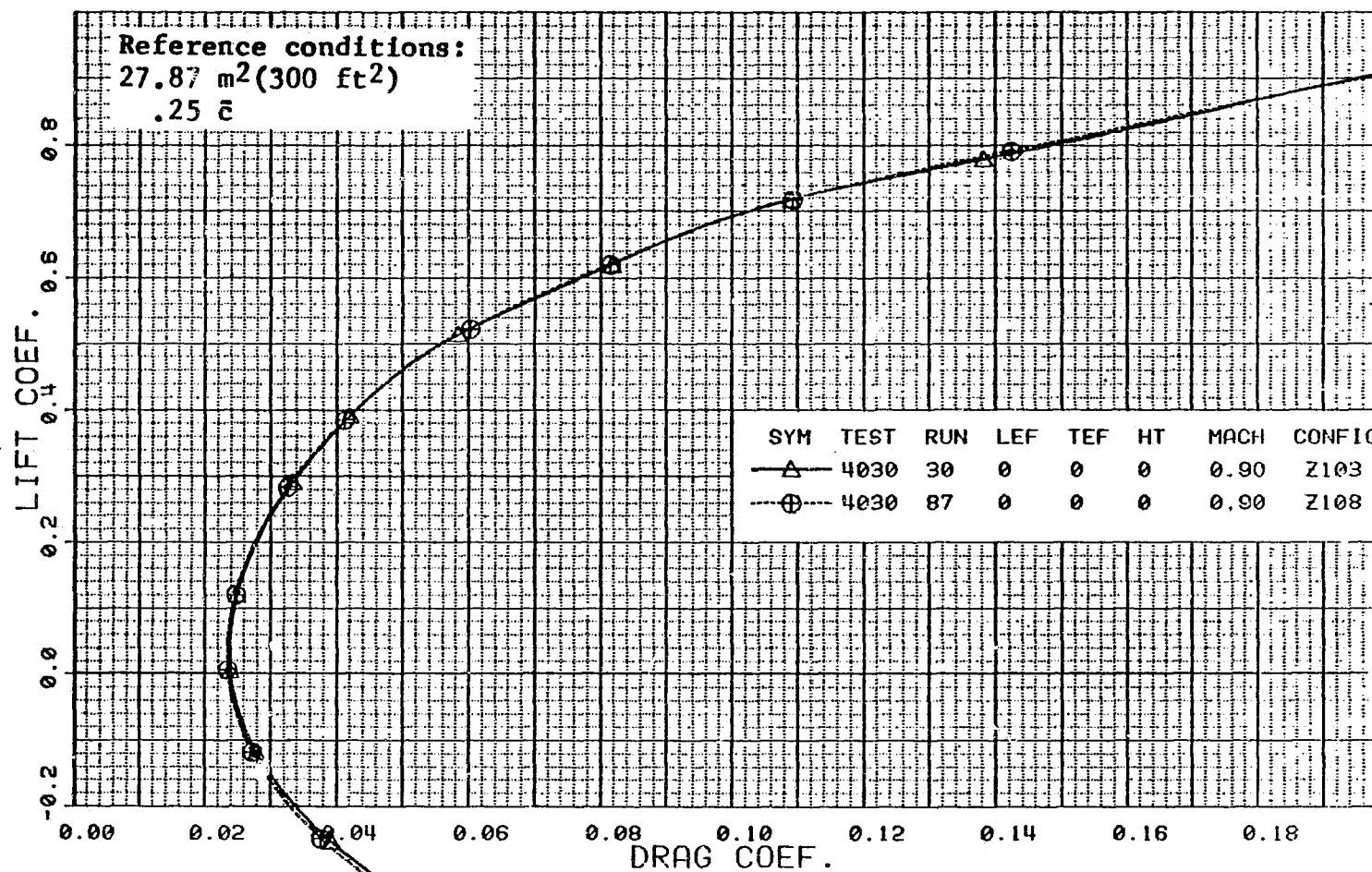


Figure 3-79 (c) Drag, Small Scale

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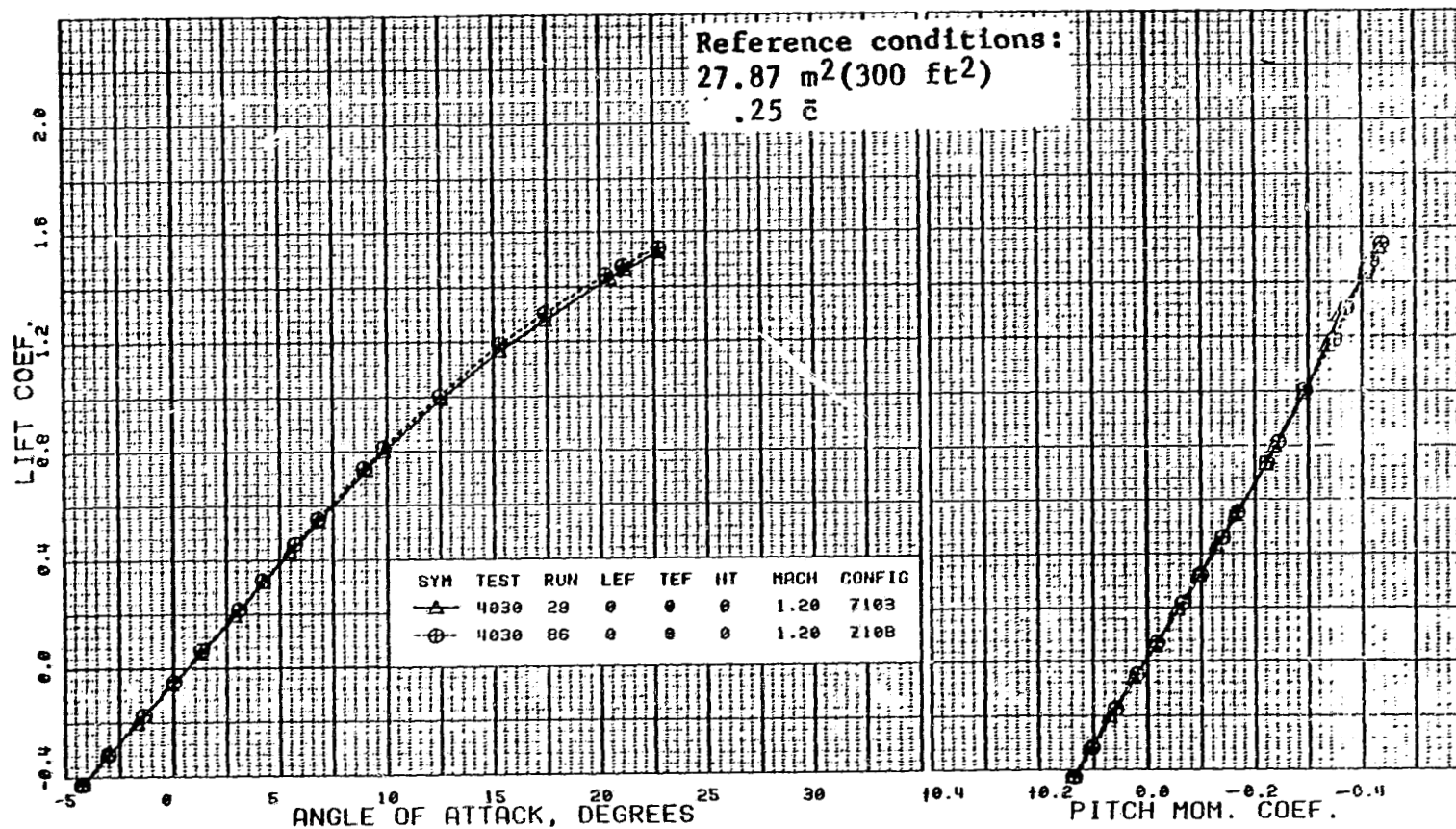


Figure 3-80 Effect of Forebody Strake Shape (Z103, Z108), F-16, $M = 1.20$
 (a) Lift and Pitching Moment

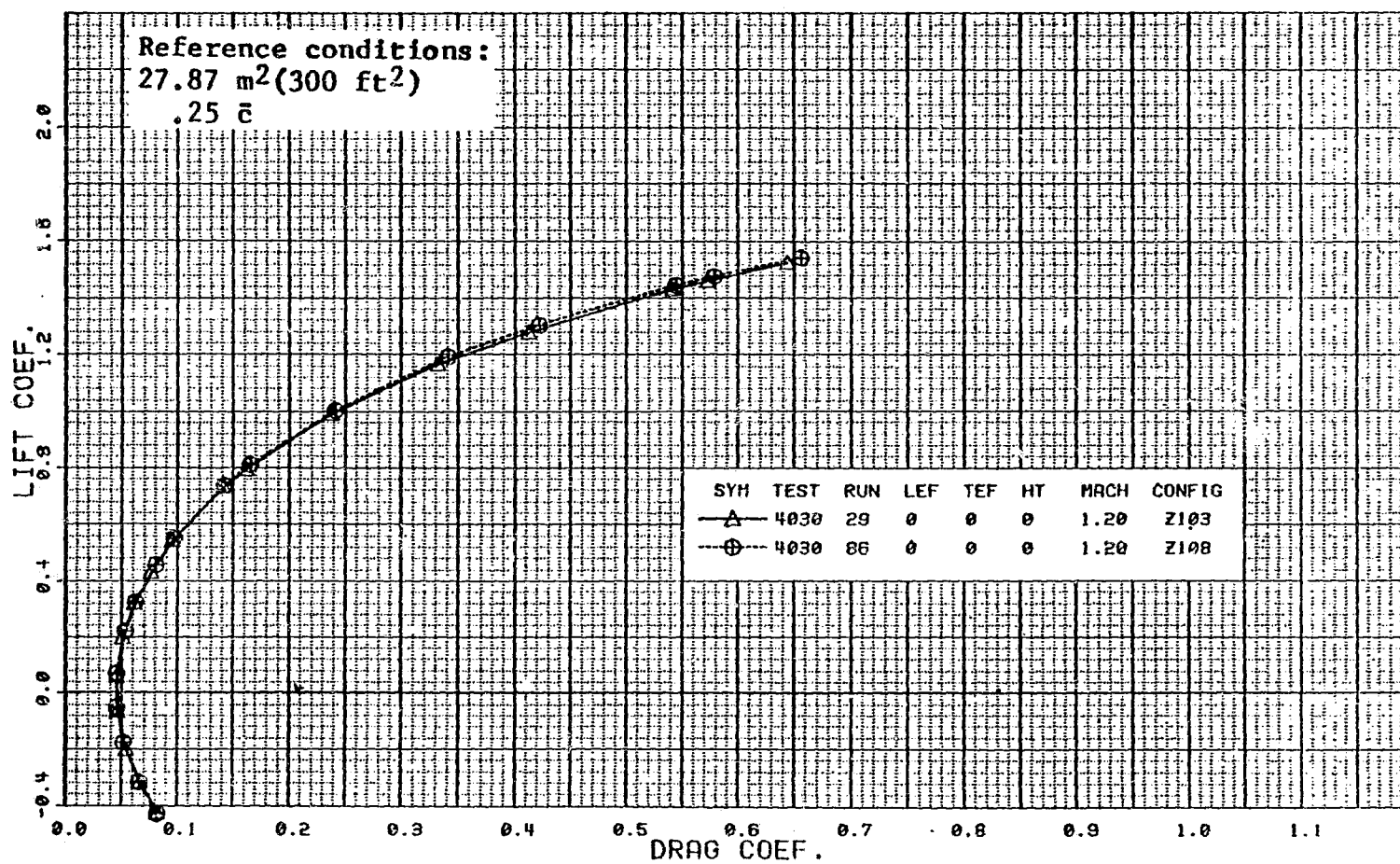


Figure 3-80 (b) Drag, Large Scale

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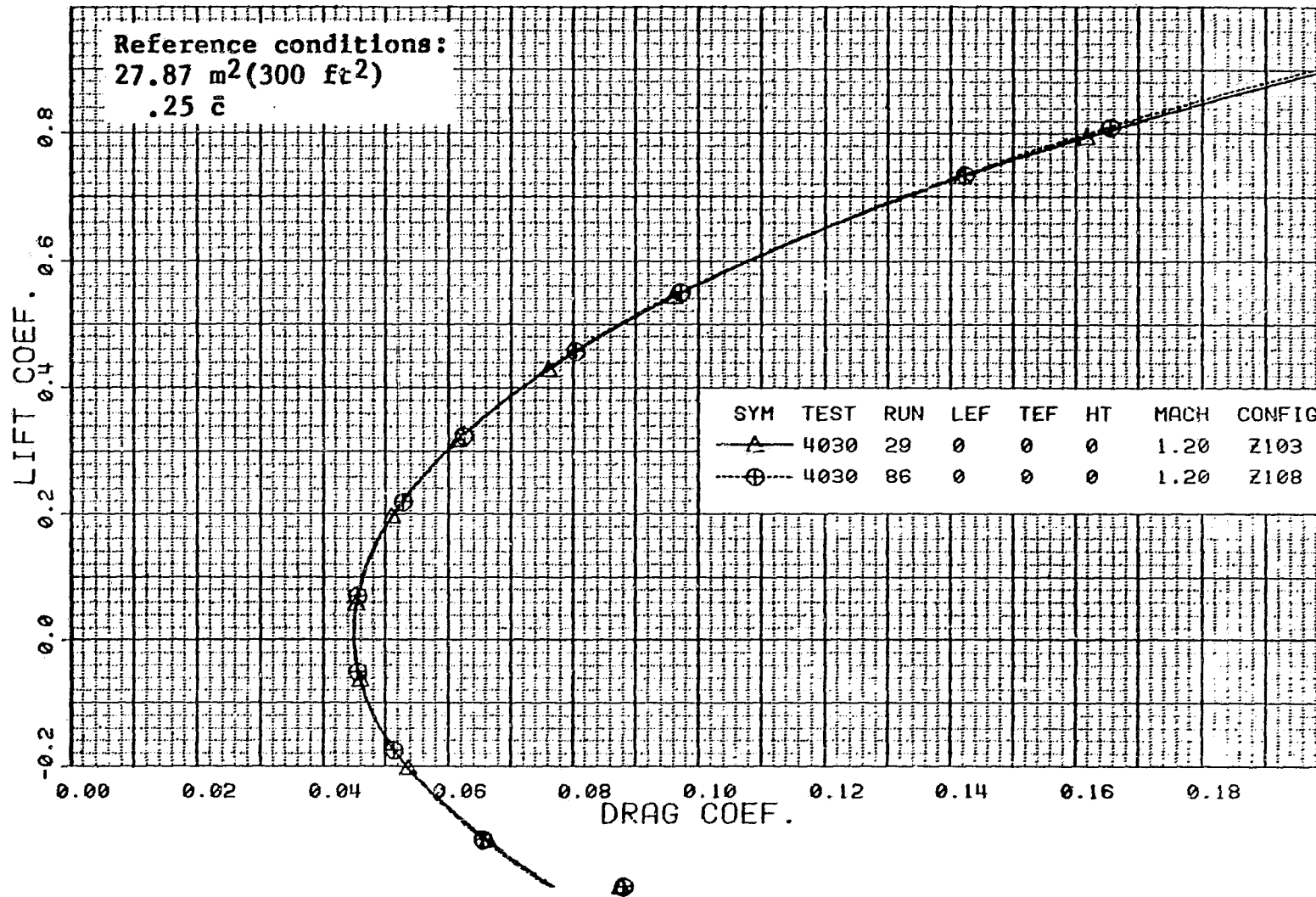


Figure 3-80 (c) Drag, Small Scale

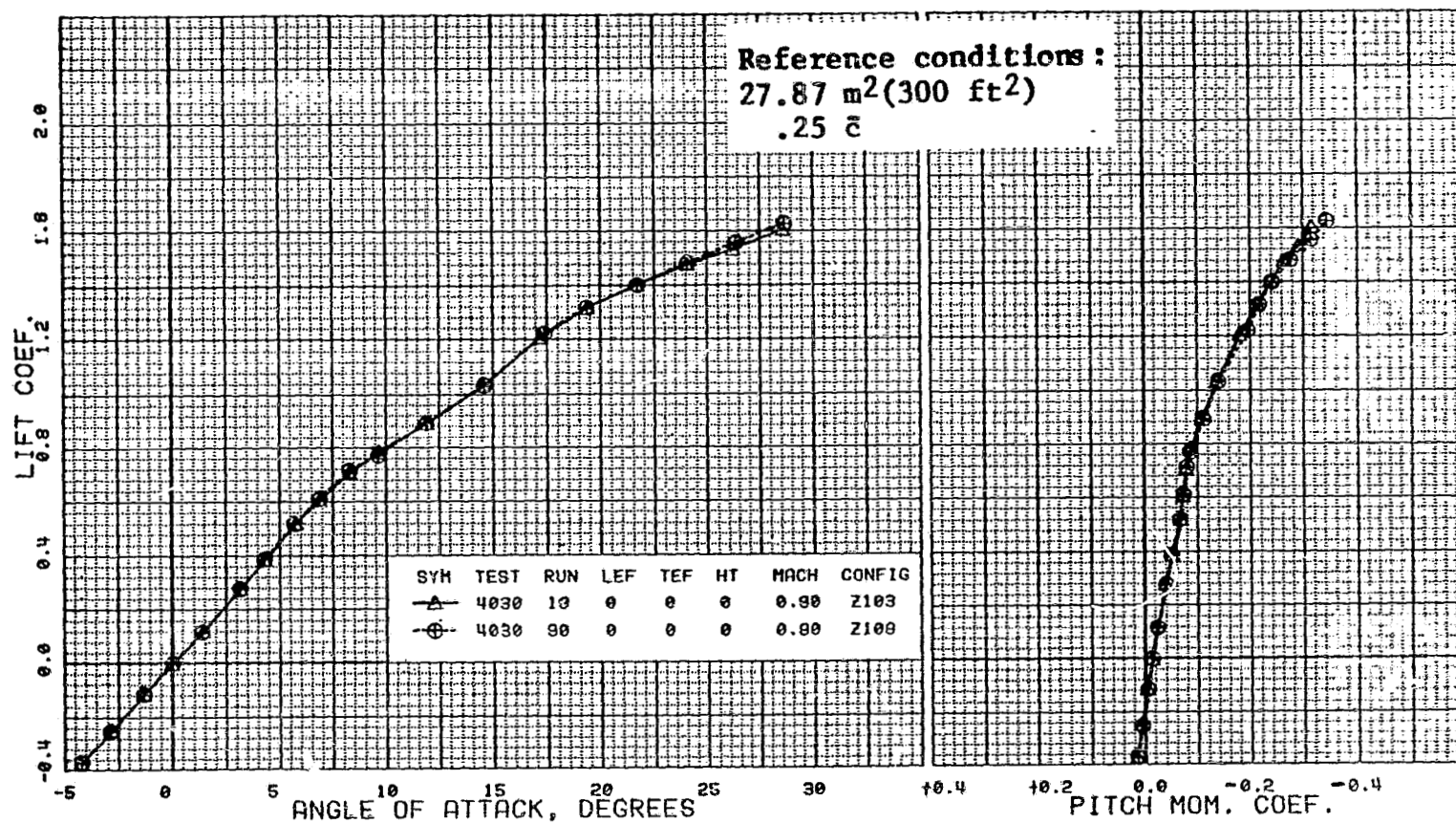


Figure 3-81 Effect of Forebody Strake Forward Extent (Z103,Z109), F-16,
 $M = 0.90$
 (a) Lift and Pitching Moment

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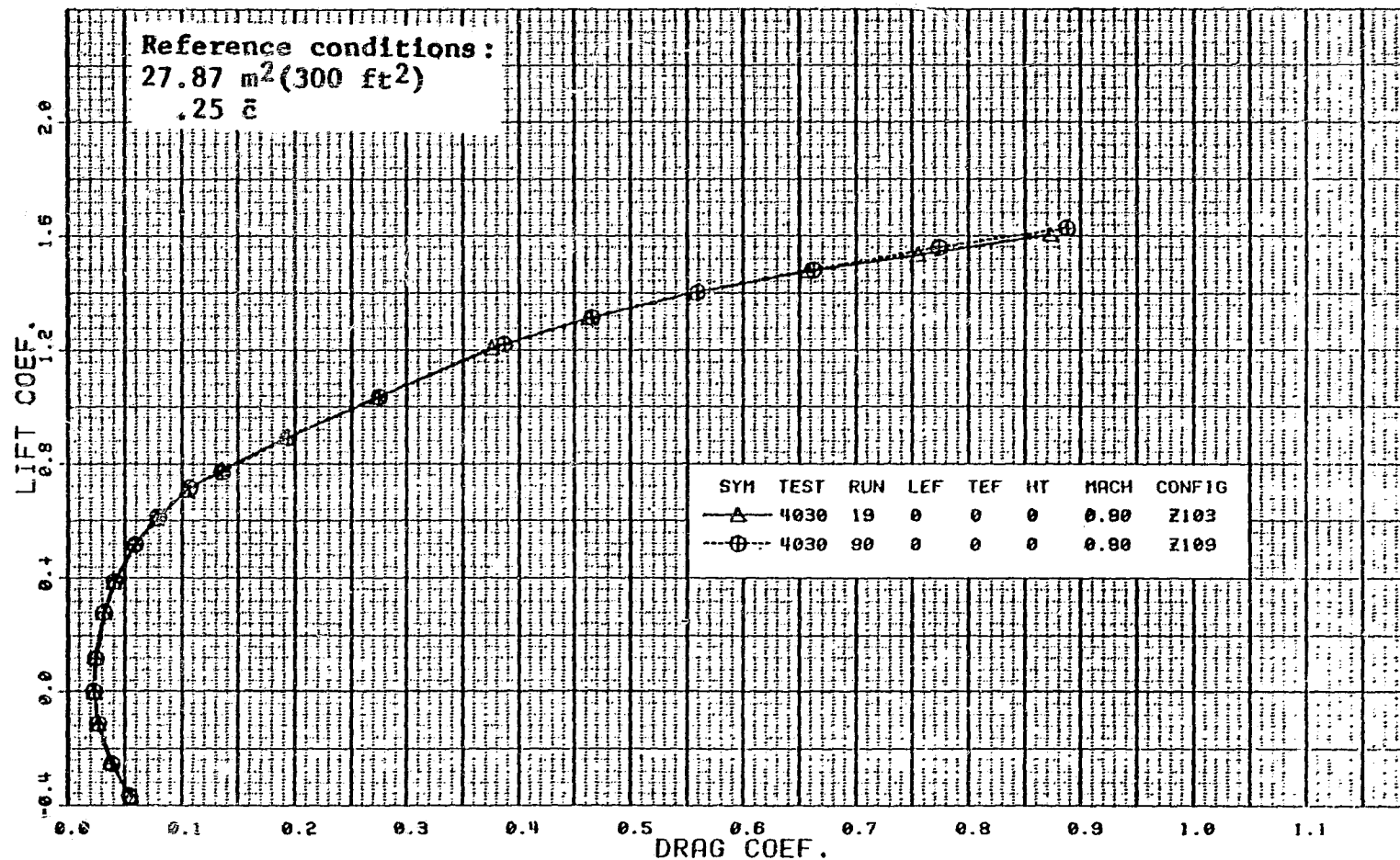


Figure 3-81 (b) Drag, Large Scale

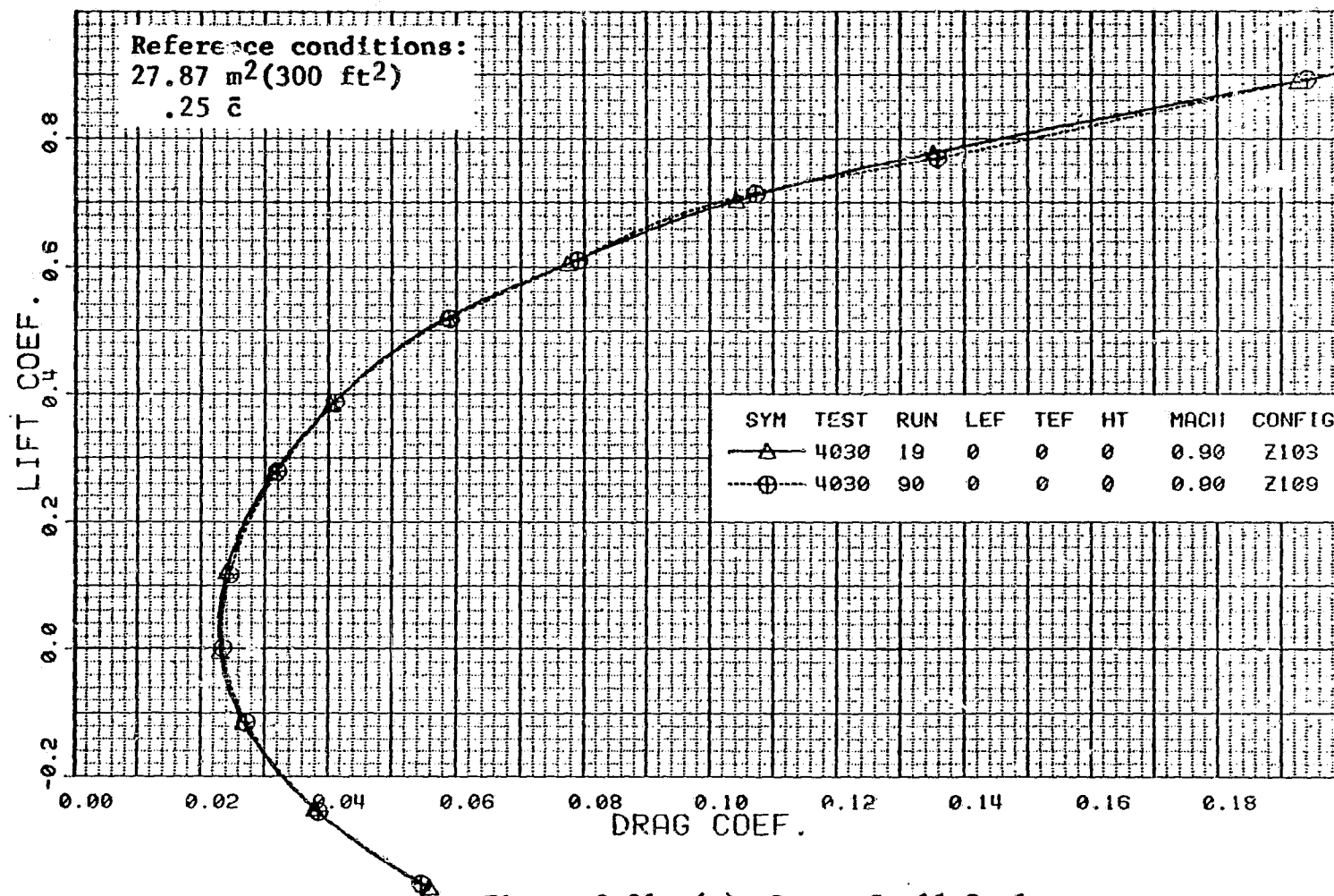


Figure 3-81 (c) Drag, Small Scale

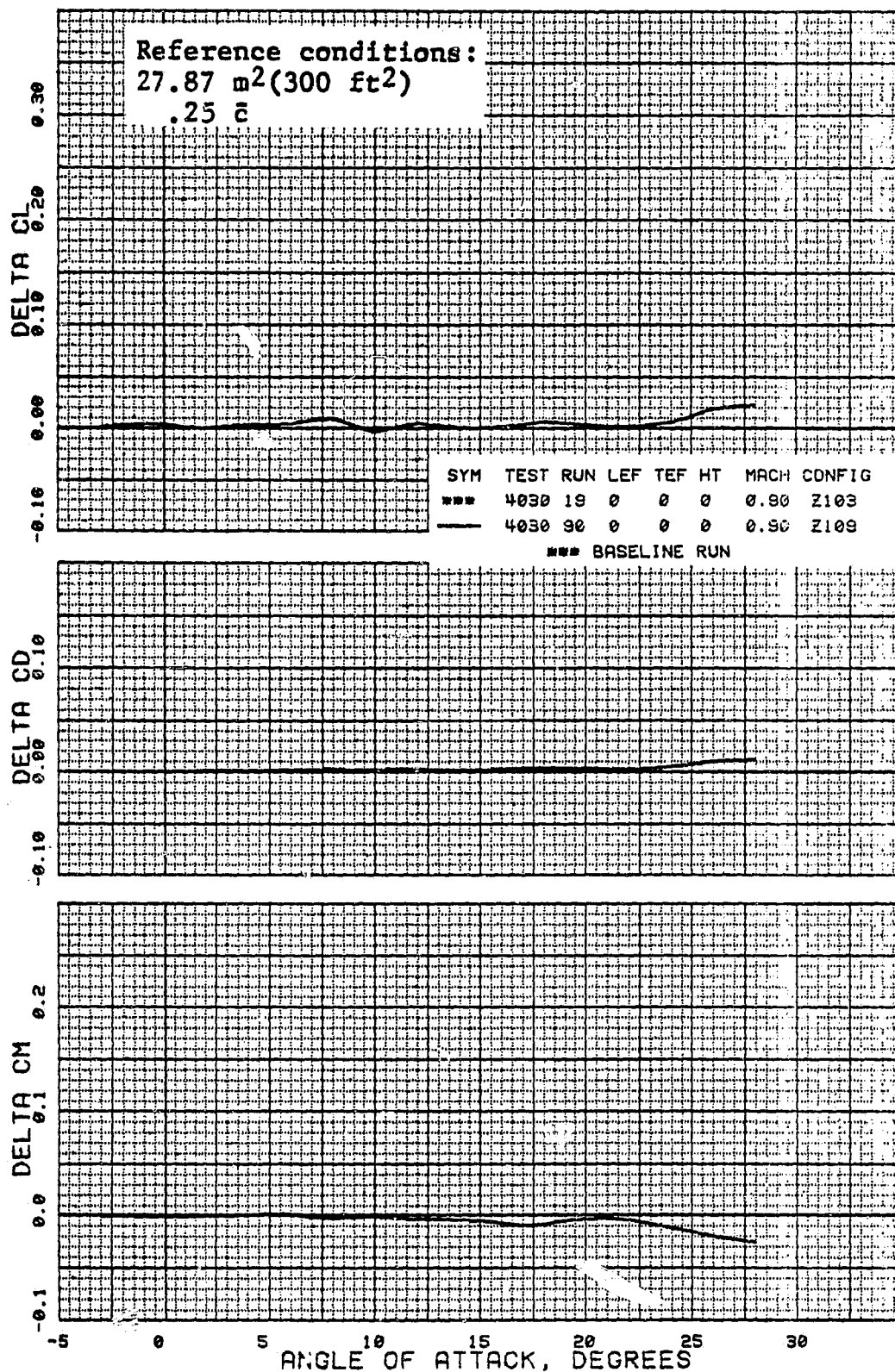


Figure 3-81 (d) Increments

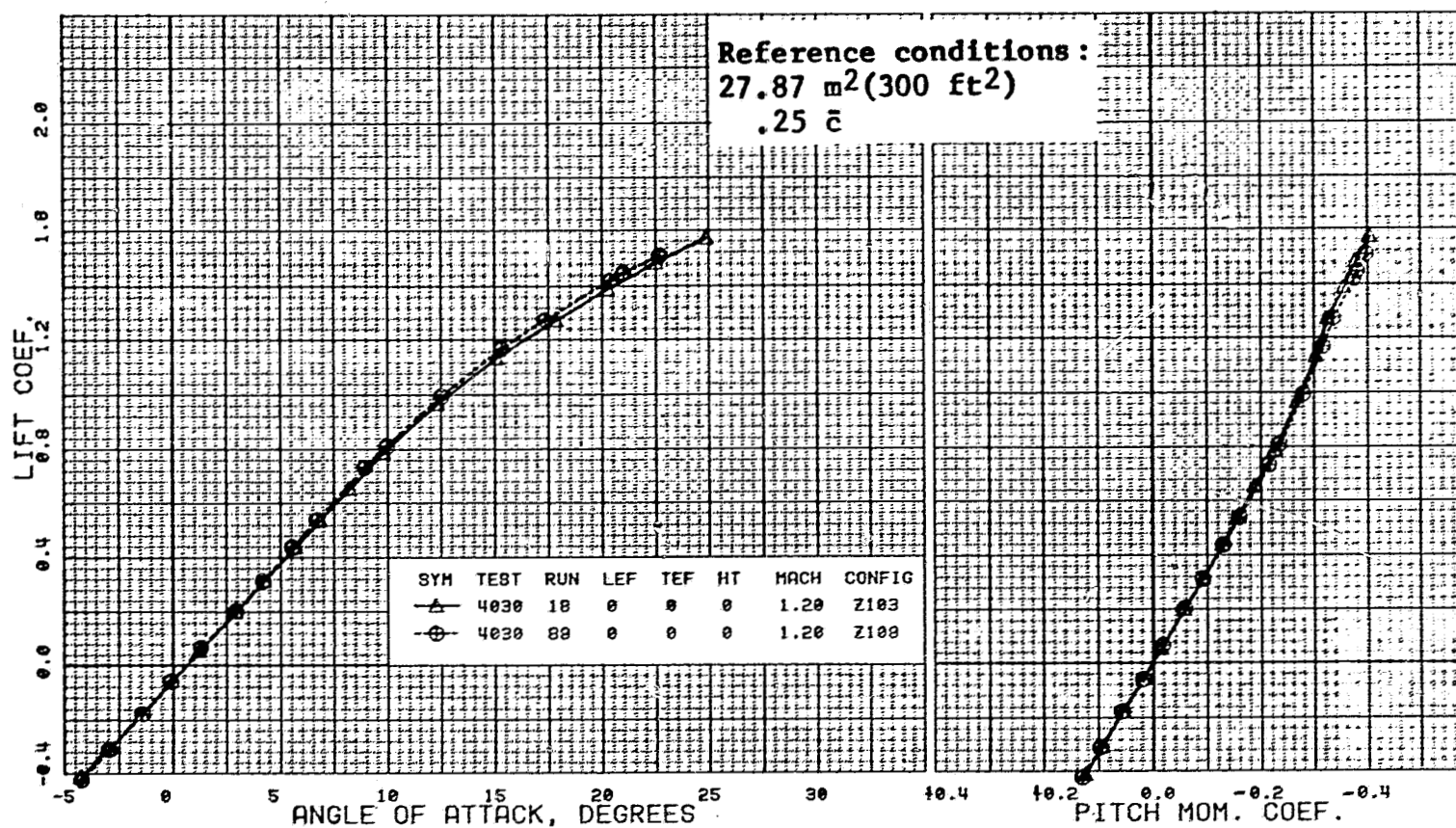


Figure 3-82 Effect of Forebody Strake Forward Extend (Z103,A109), F-16,
 $M = 1.20$
 (a) Lift and Pitching Moment

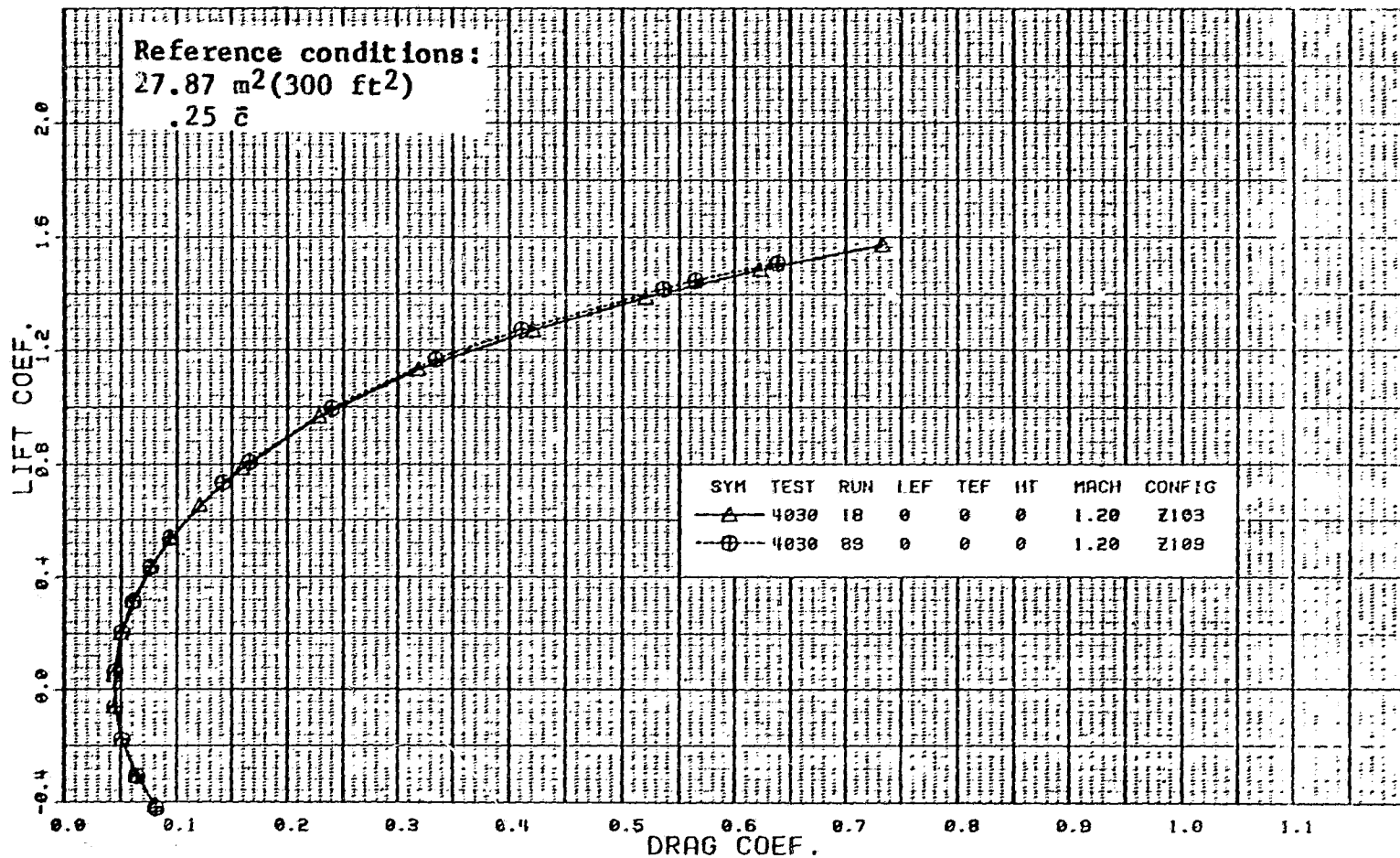


Figure 3-82 (b) Drag, Large Scale

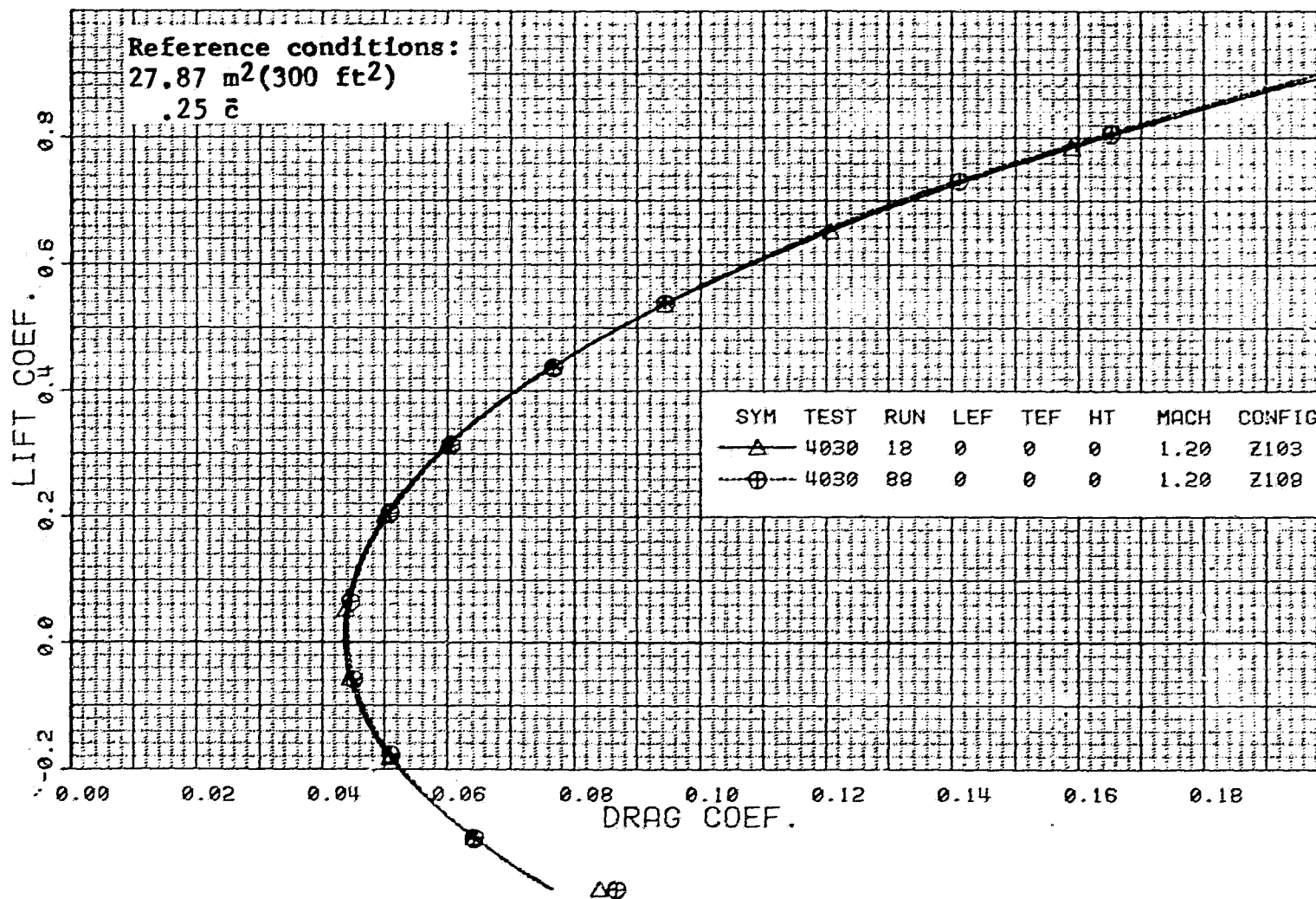


Figure 3-82 (c) Drag, Small Scale

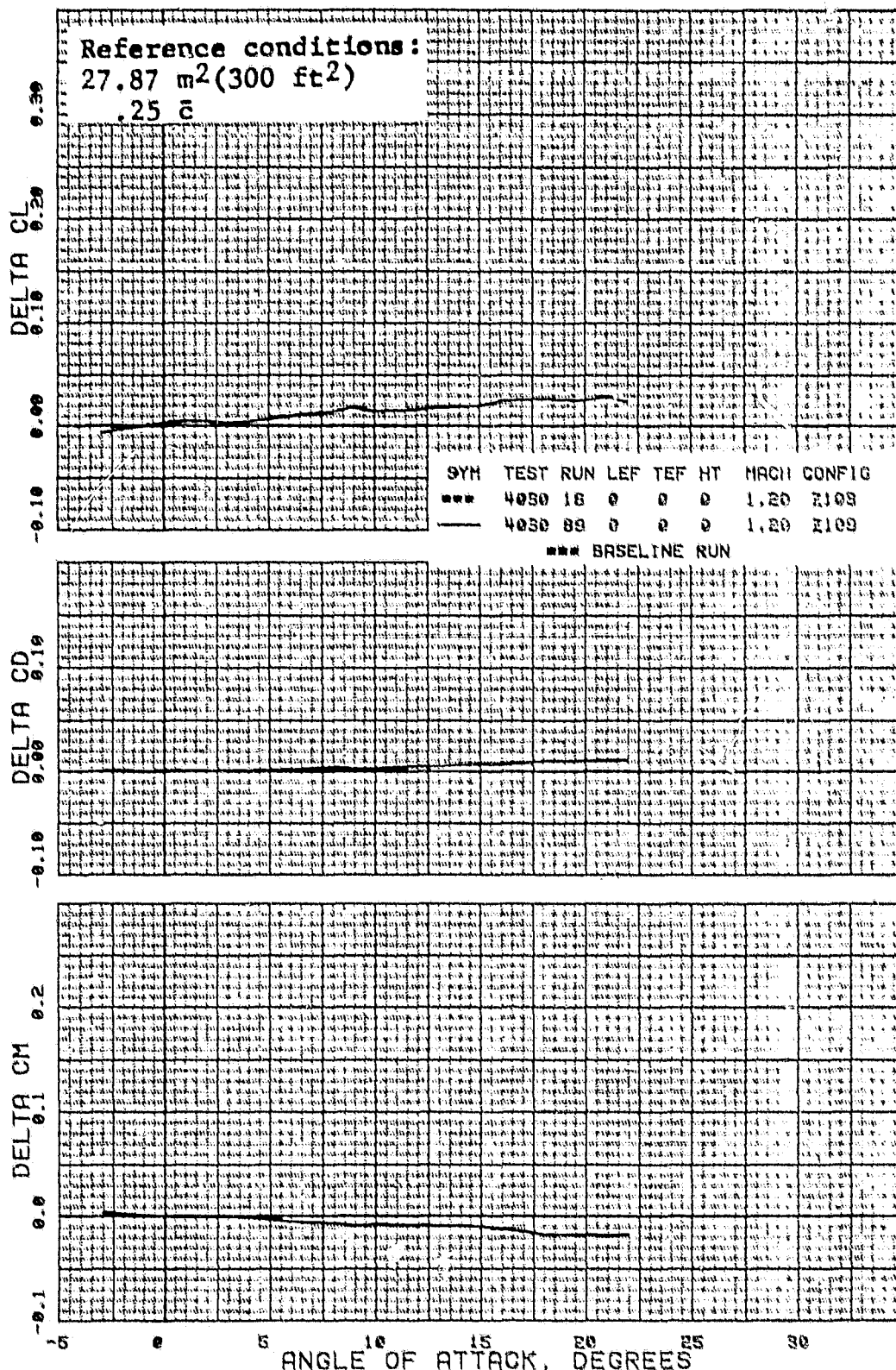


Figure 3-82 (d) Increments

4. TRANSONIC SIDESLIP DATA

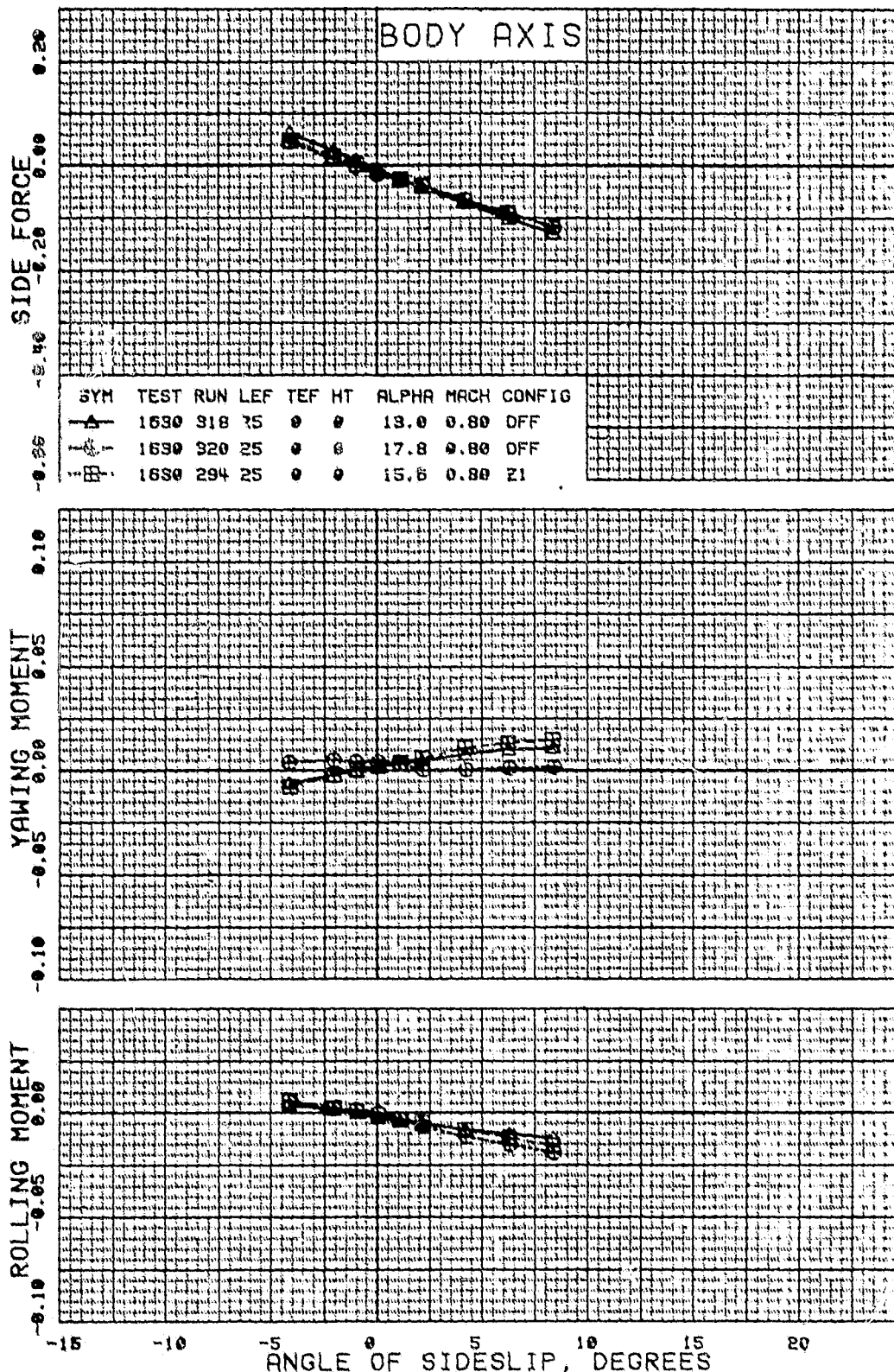


Figure 4-1 Effect of Canard Strake Z1, Configuration 401F-2 with Twin Vertical Tails
 $M = 0.80$
 (a) Force and Moments, $\alpha = 16^\circ$

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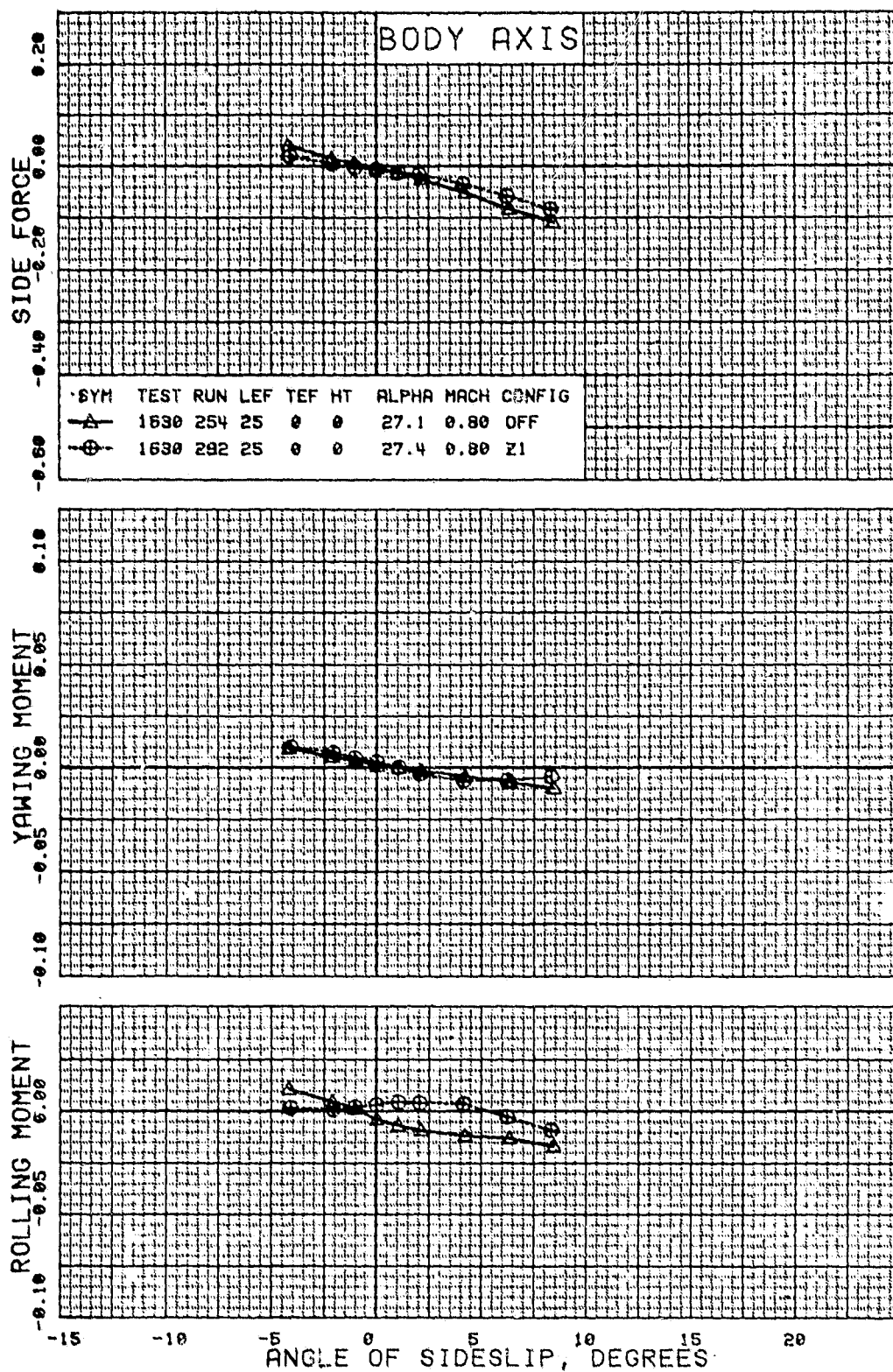


Figure 4-1 (b) Force and Moments, $\alpha = 27^\circ$

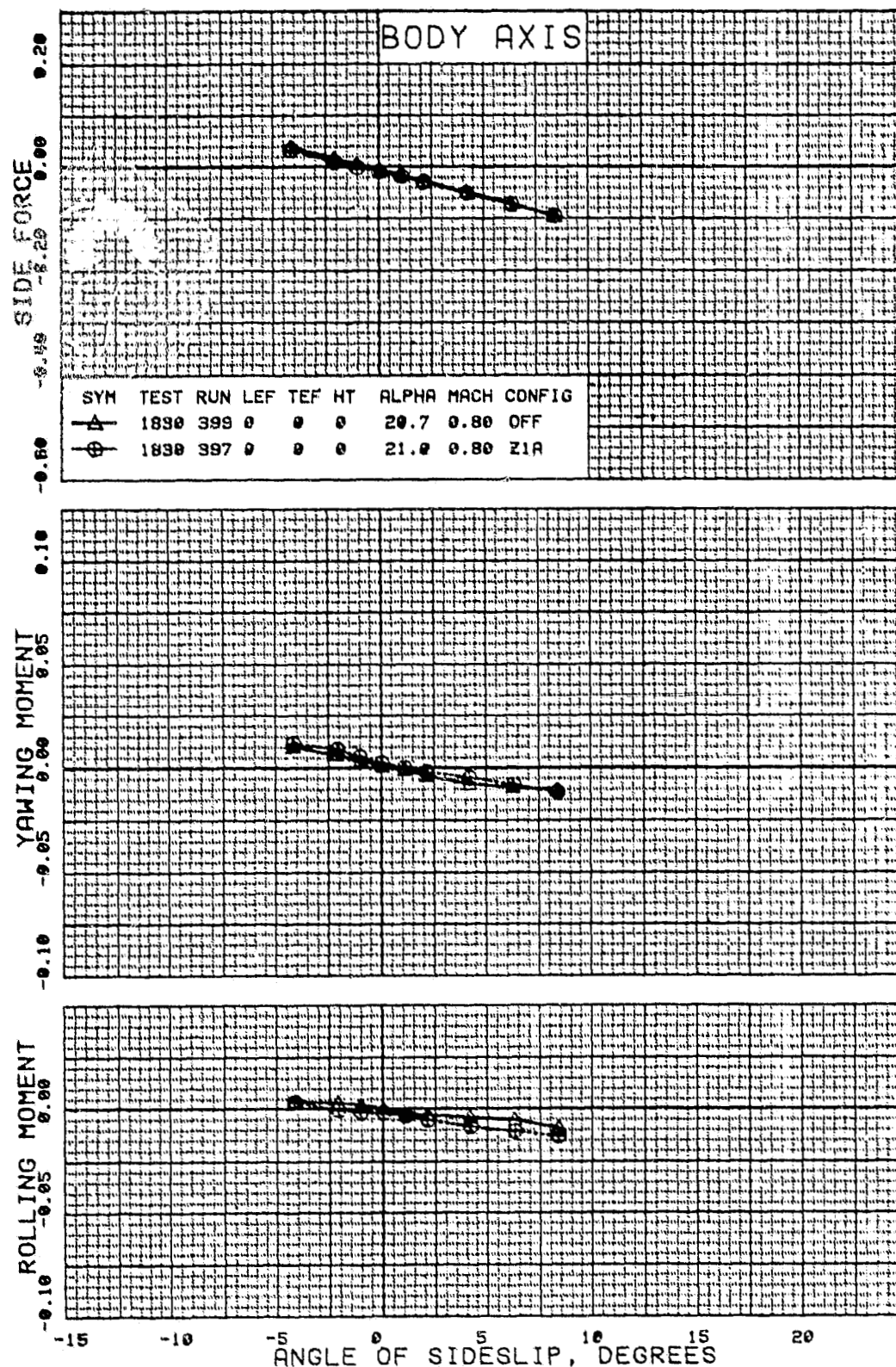


Figure 4-2 Effect of Canard and Strake Z1A, Configuration 401F-2 with 7.5° Twin Vertical Tails, M = 0.80

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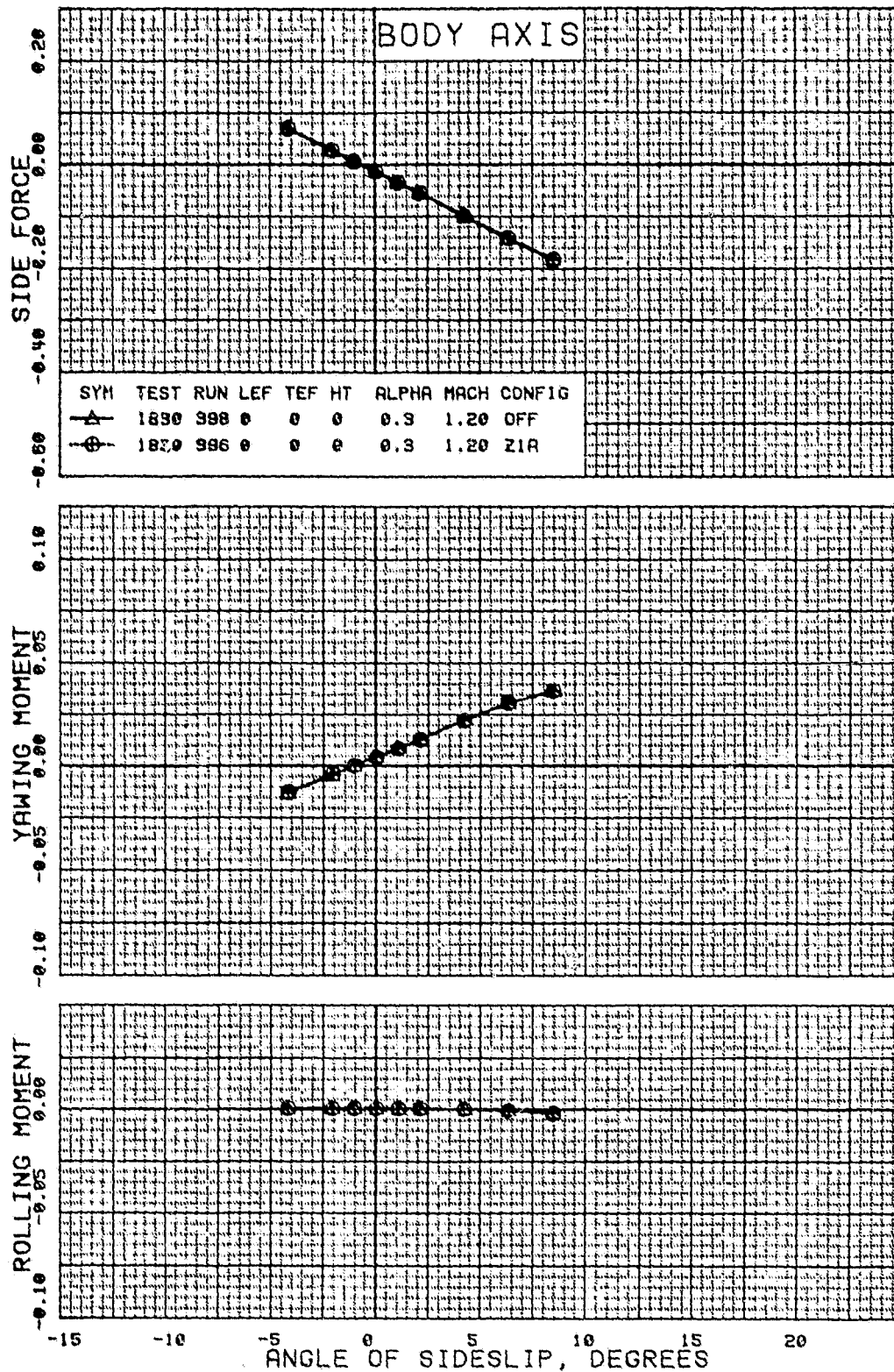


Figure 4-3 Effect of Canard Strake Z1A, Configuration 401F-2, with 7.5° Twin Vertical Tails, M = 1.20

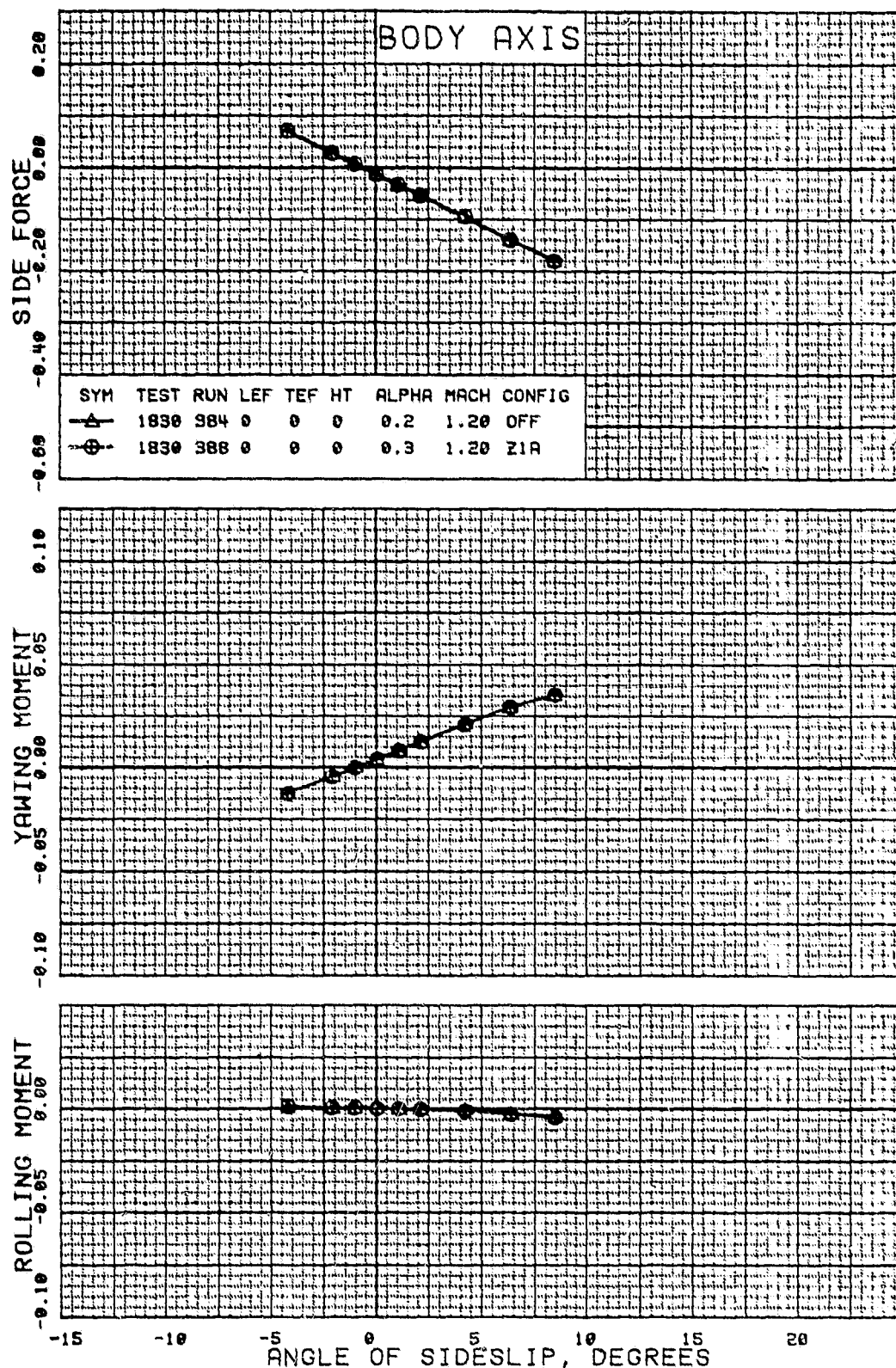


Figure 4-4 Effect of Canard Strake Z1A, Configuration 401F-2 With 15° Twin Vertical Tails, M = 1.20
(a) Force and Moments, $\alpha = 0^\circ$

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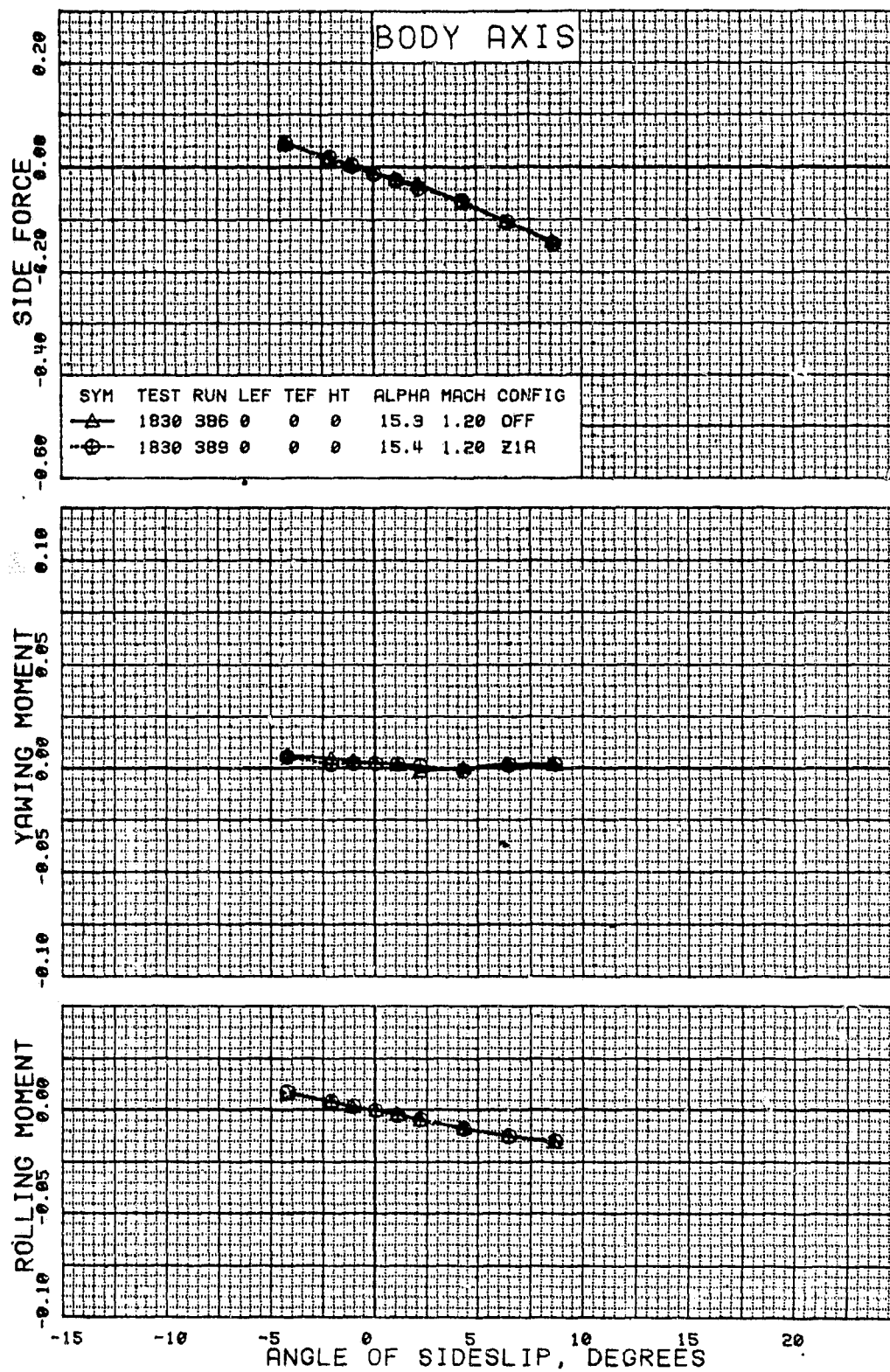


Figure 4-4 (b) Force and Moments, $\alpha = 15^\circ$

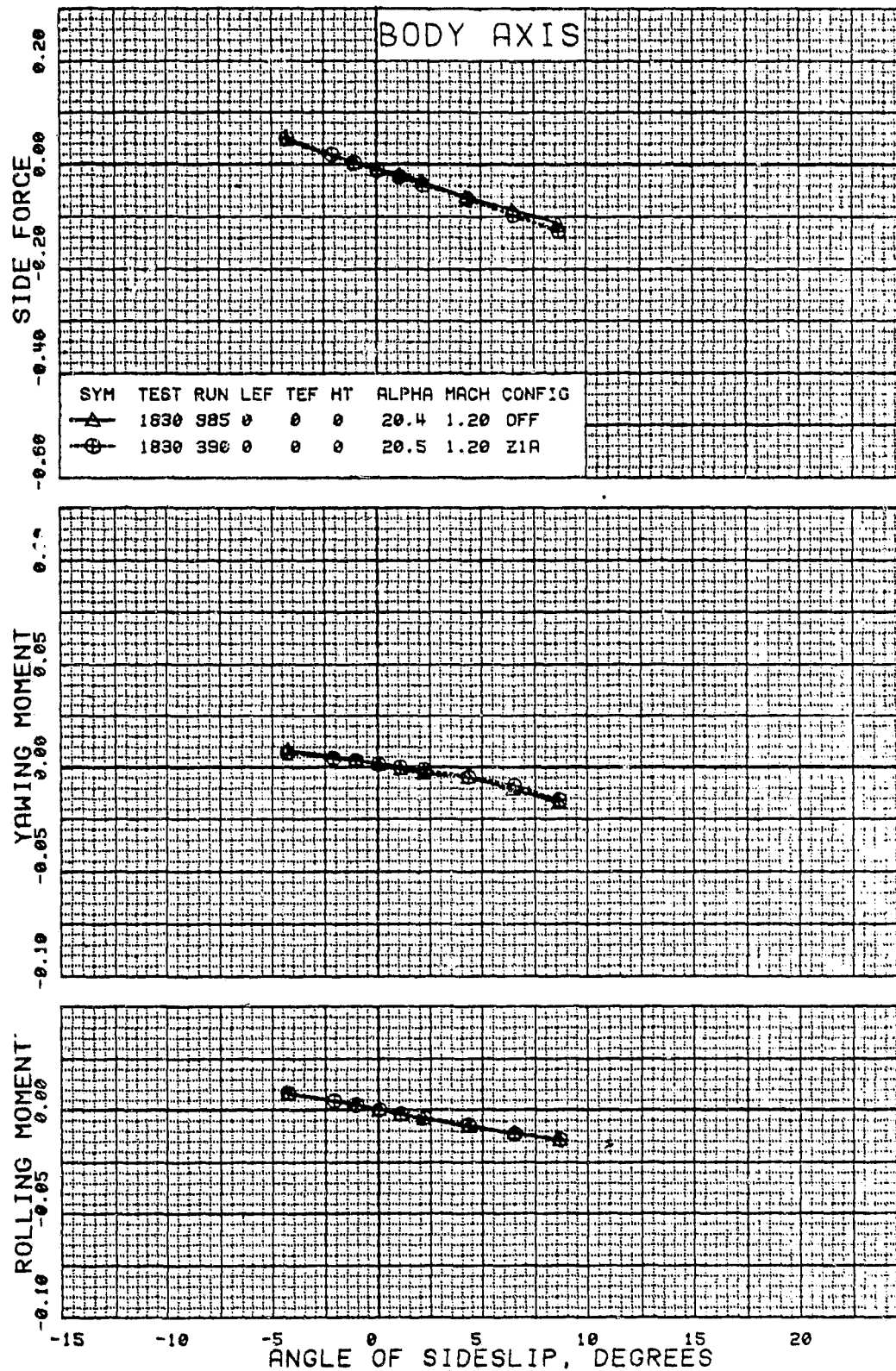


Figure 4-4 (c) Force and Moments, $\alpha = 20^\circ$

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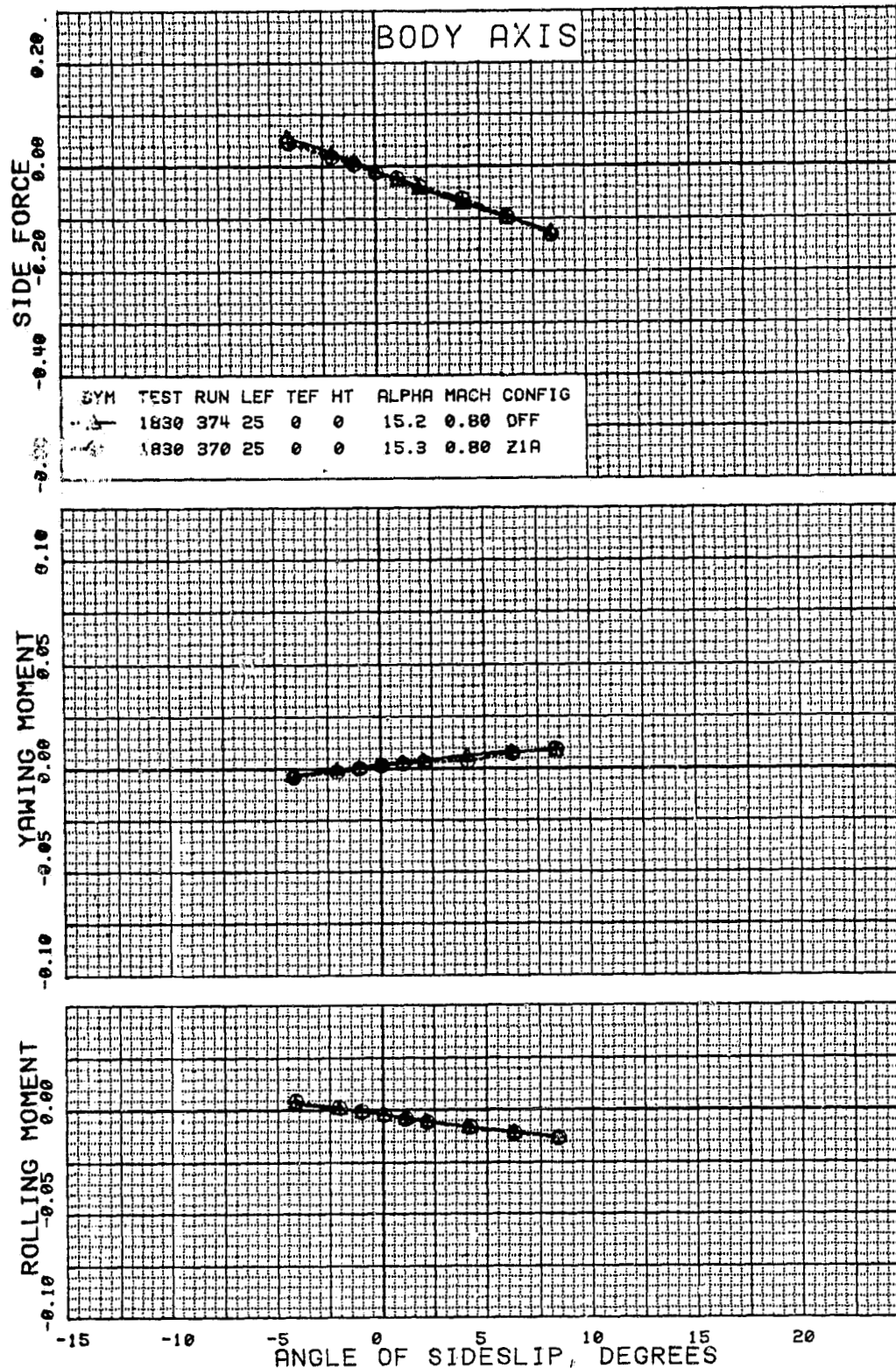


Figure 4-5 Effect of Canard Strake Z1A, Configuration 401F-2 With 15° Twin Vertical Tails, LEF = 25°, M = 0.80
(a) Force and Moments, $\alpha = 15^\circ$

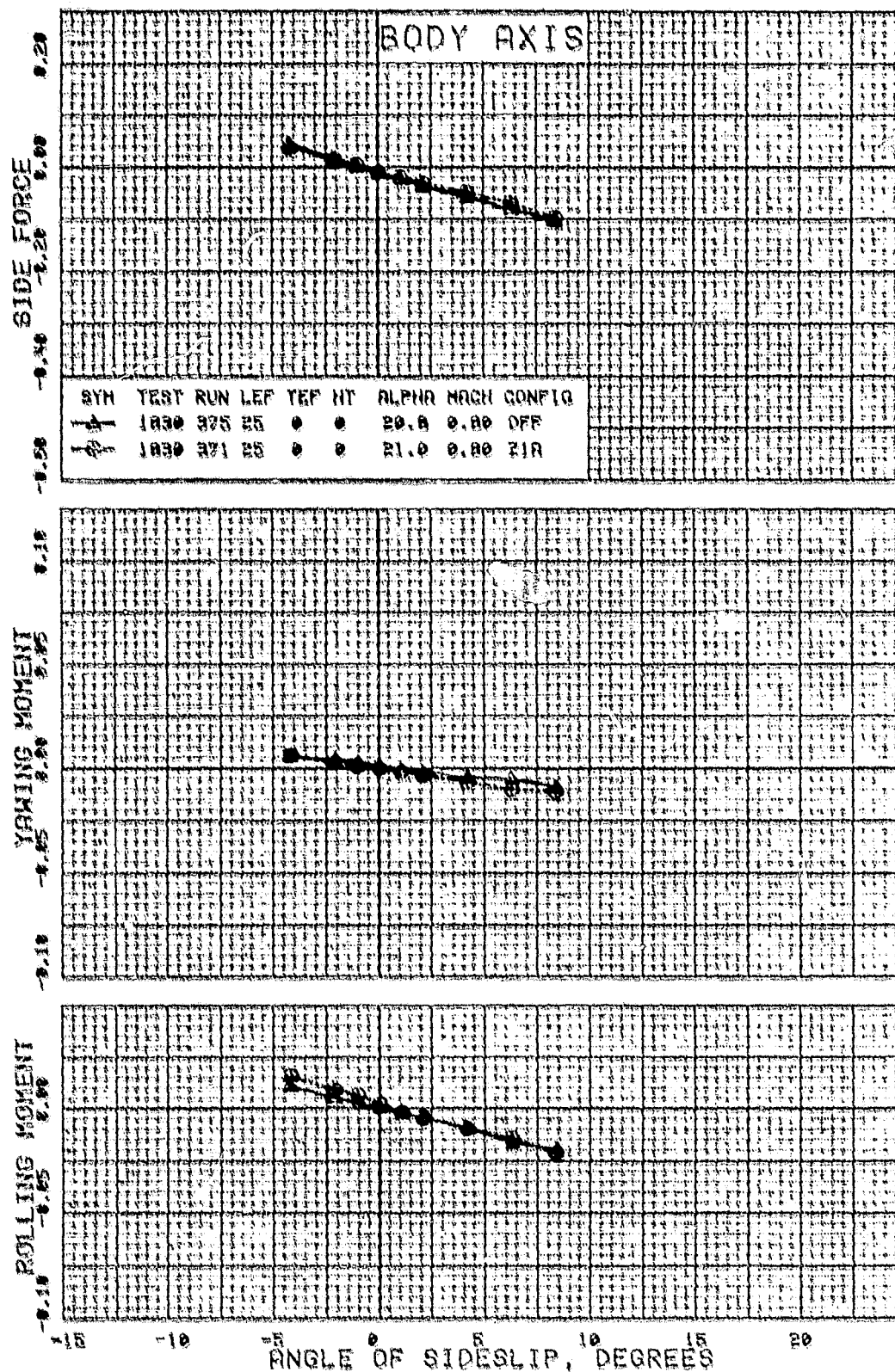


Figure 4-5 (b) Force and Moments, $\alpha = 21^\circ$

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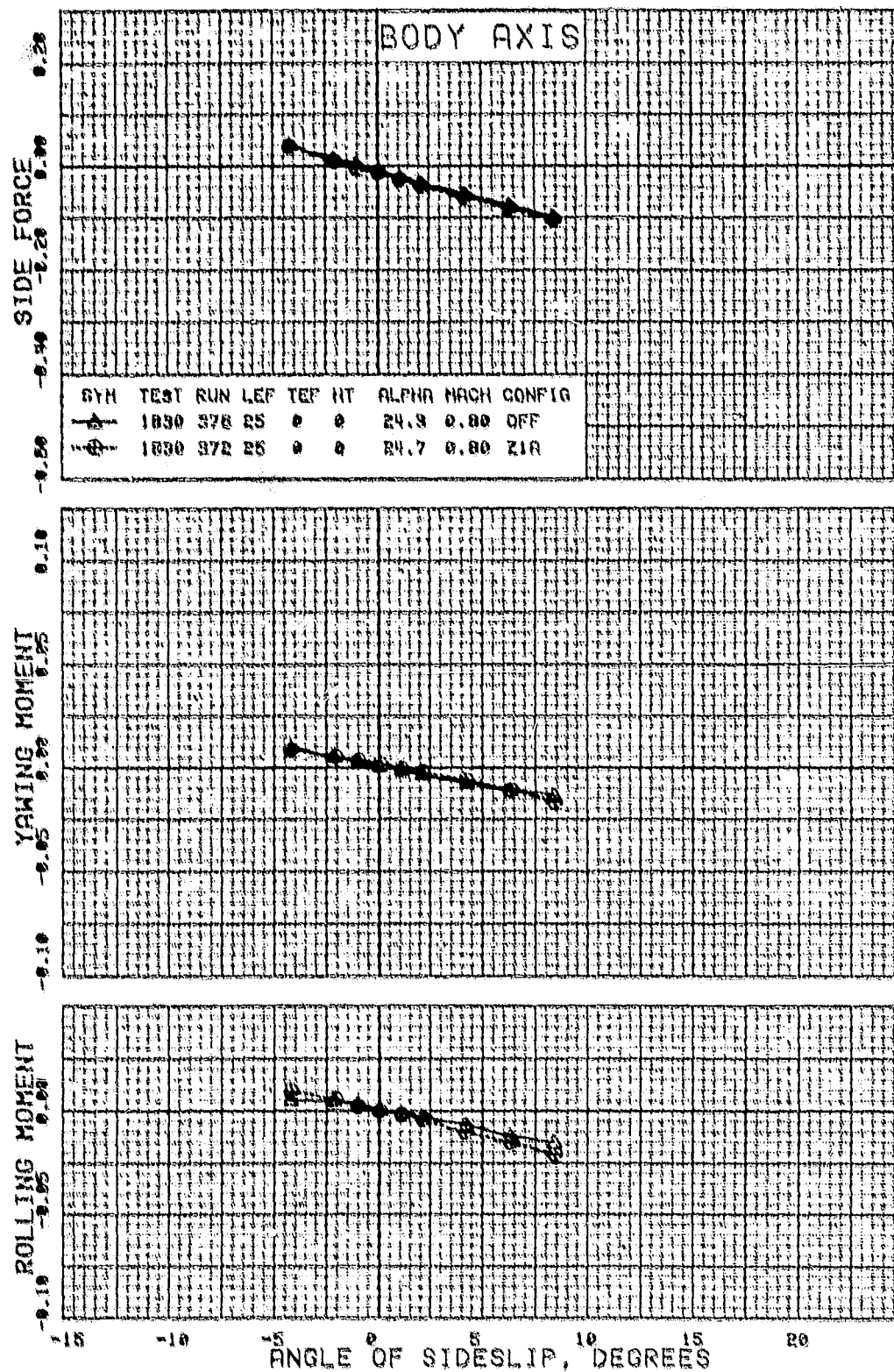


Figure 4-5 (c) Force and Moments, $\alpha = 24^\circ$

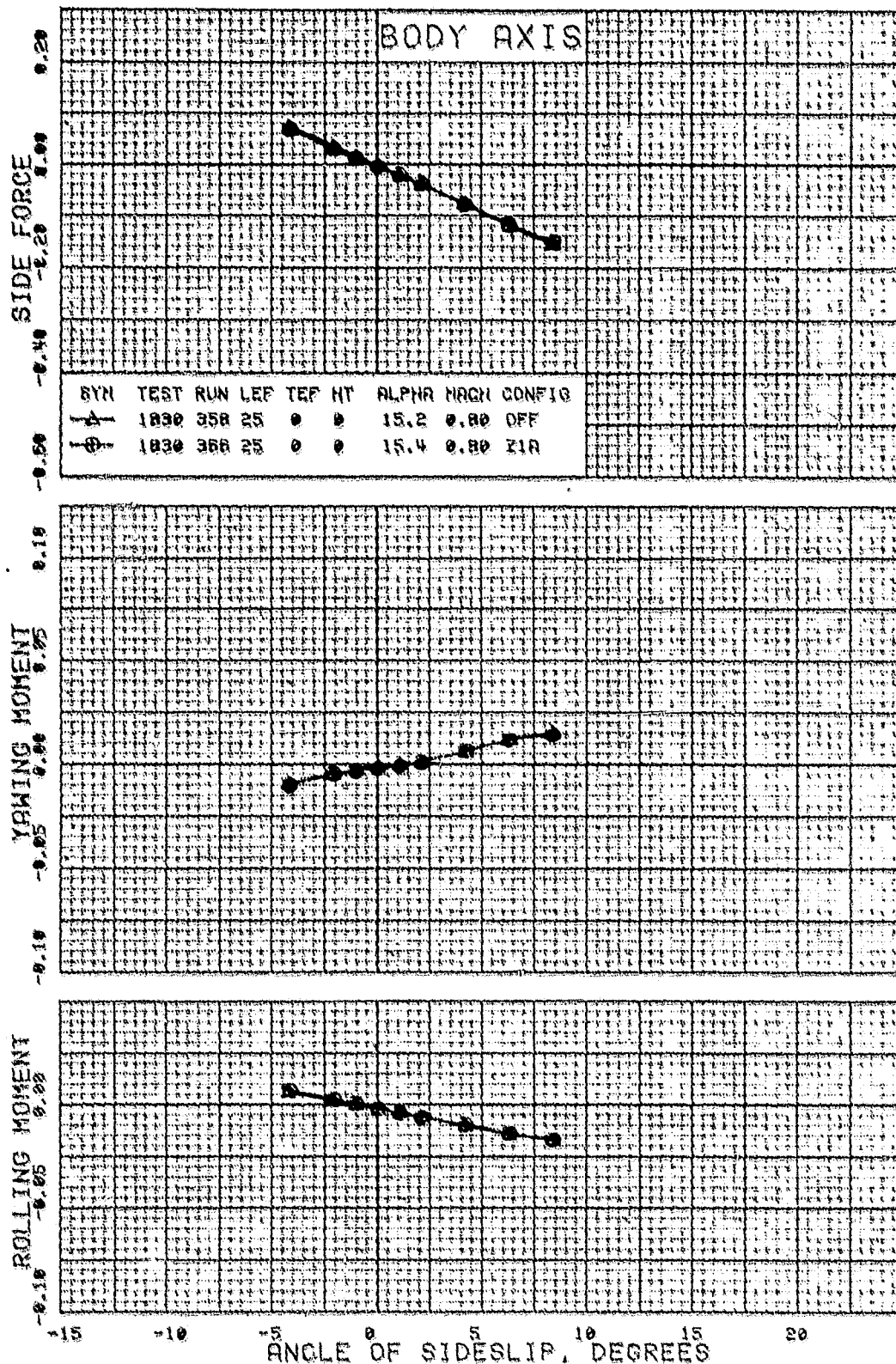


Figure 4-6 Effect of Canard Strake Z1A, Configuration 401F-2 With Single Vertical Tail
 LEF = 25° , $M = 0.80$
 (a) Force and Moments, $\alpha = 15^\circ$

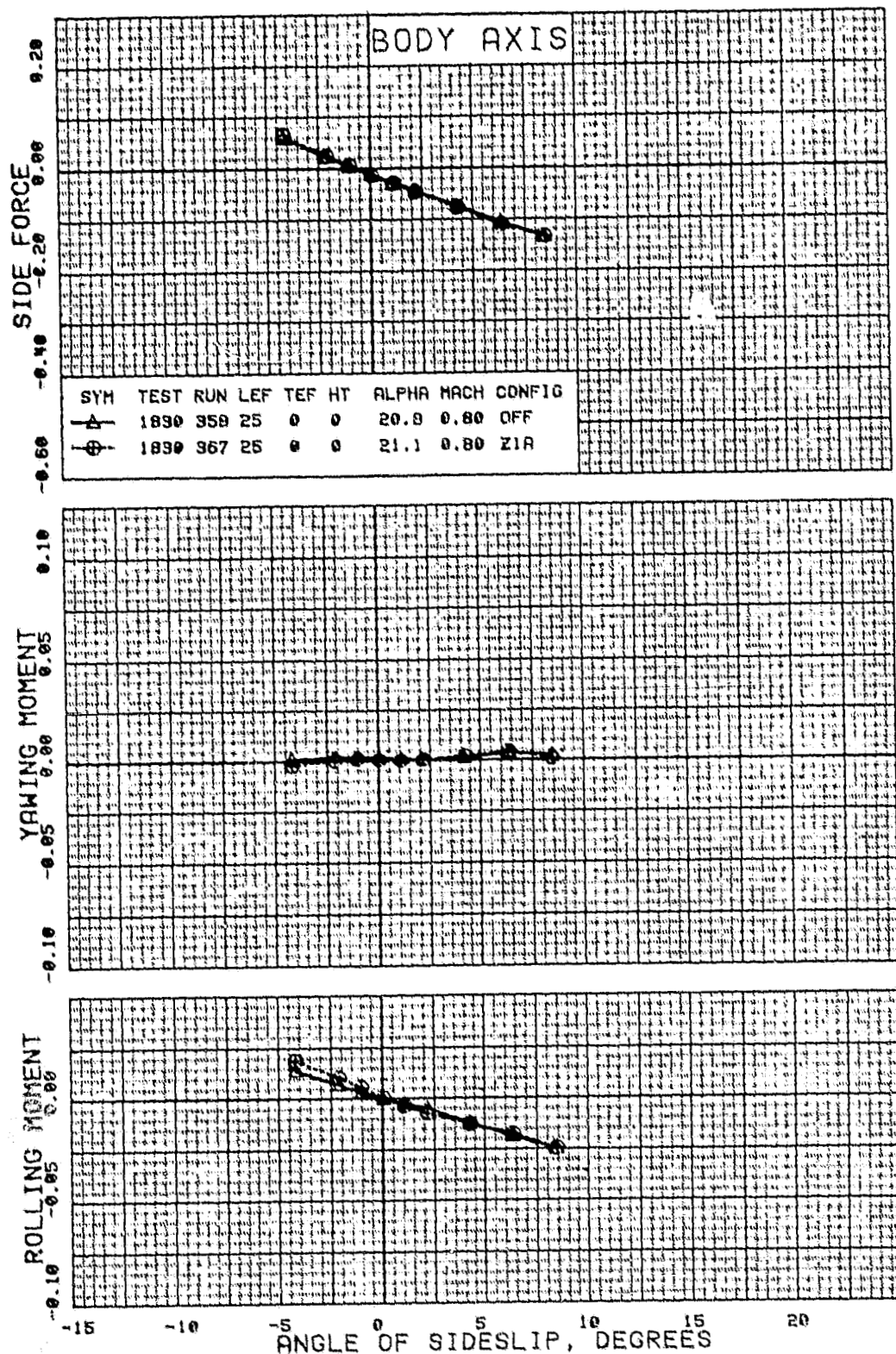


Figure 4-6 (b) Force and Moments, $\alpha = 21^\circ$

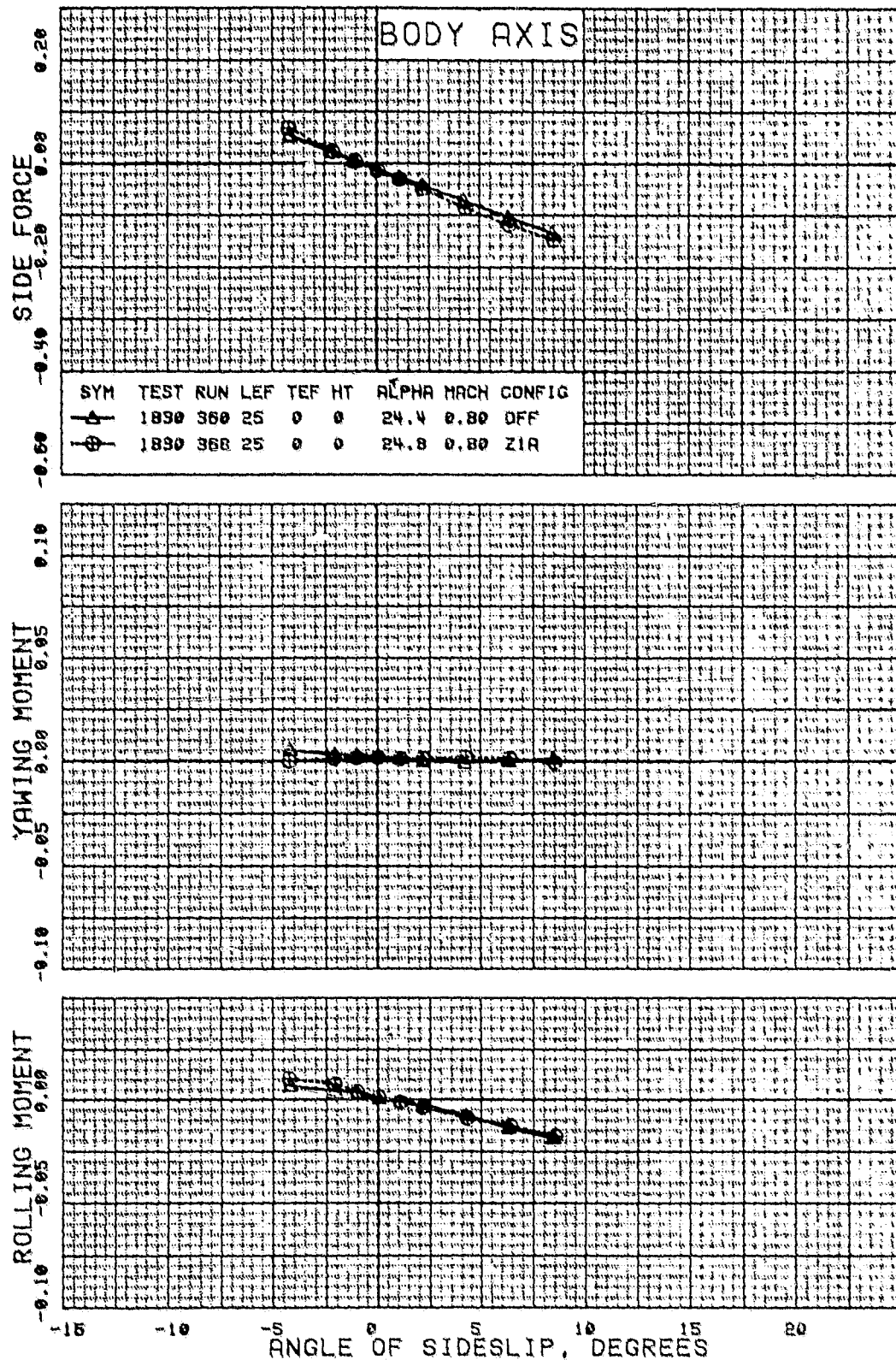


Figure 4-6 (c) Force and Moments, $\alpha = 24^\circ$

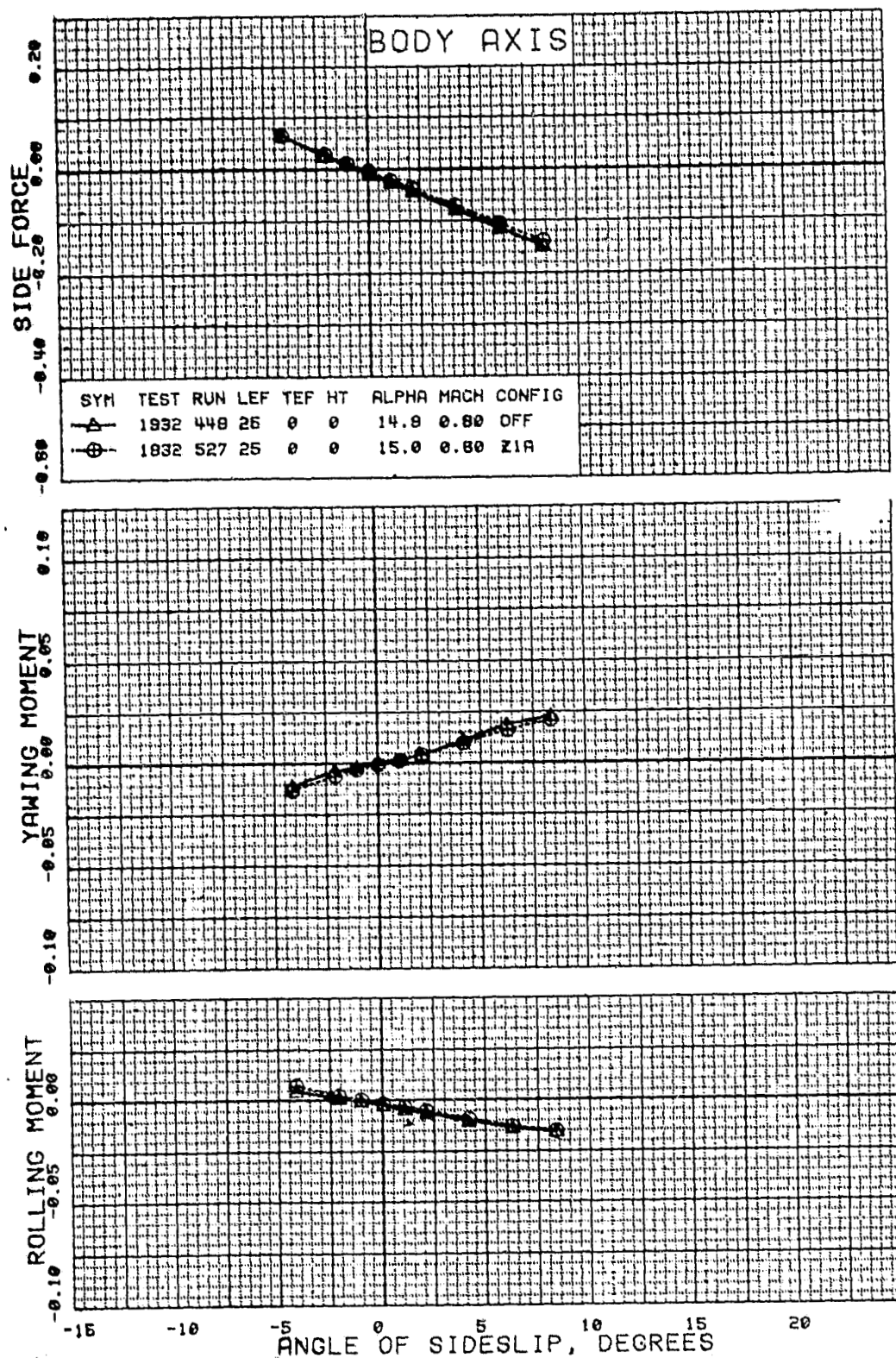


Figure 4-7 Effect of Canard Strake Z1A, Configuration
401F-5, LEF = 25°, M = 0.80
(a) Force and Moments, $\alpha = 15^\circ$

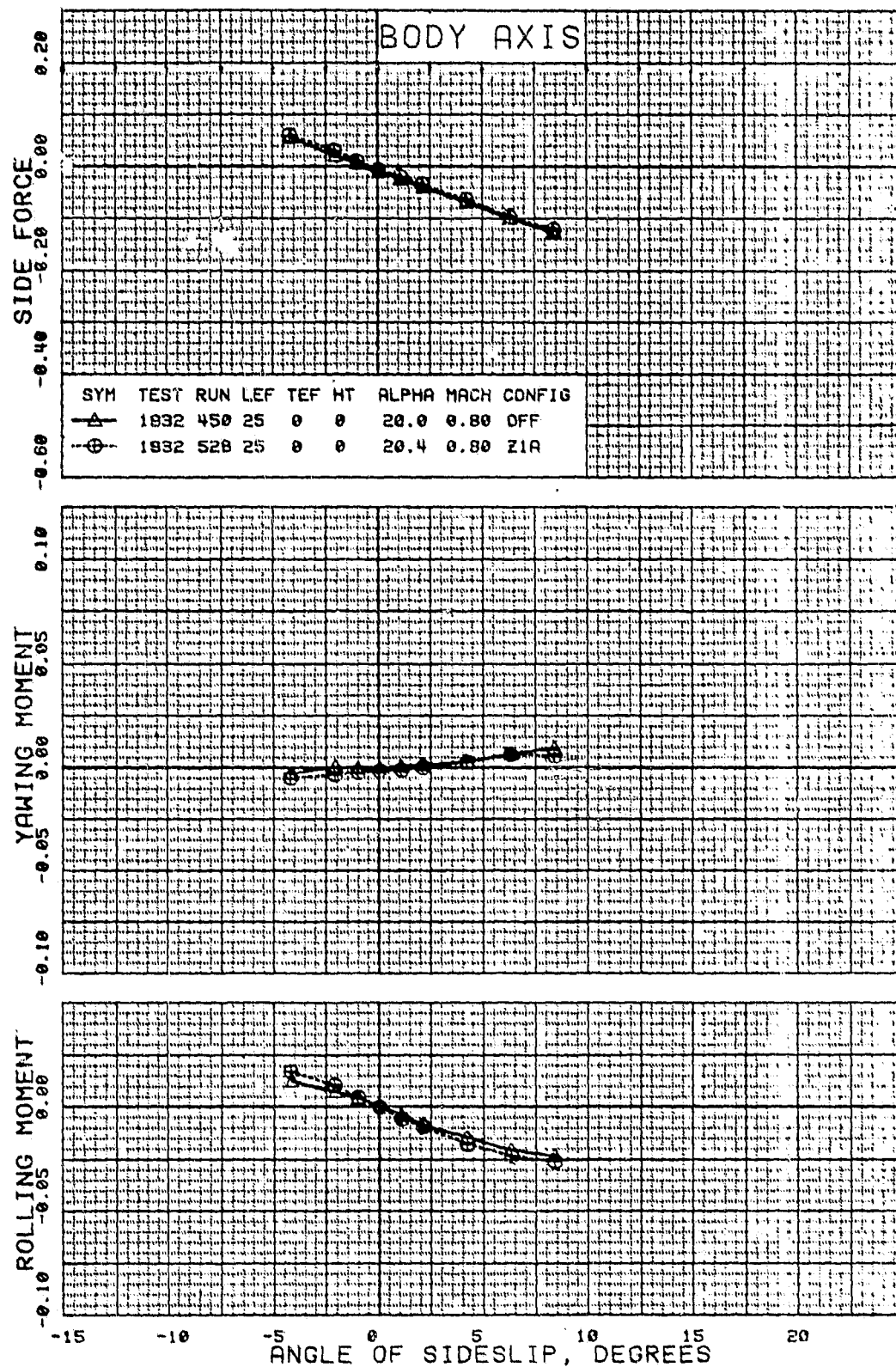


Figure 4-7 (b) Force and Moments, $\alpha = 20^\circ$

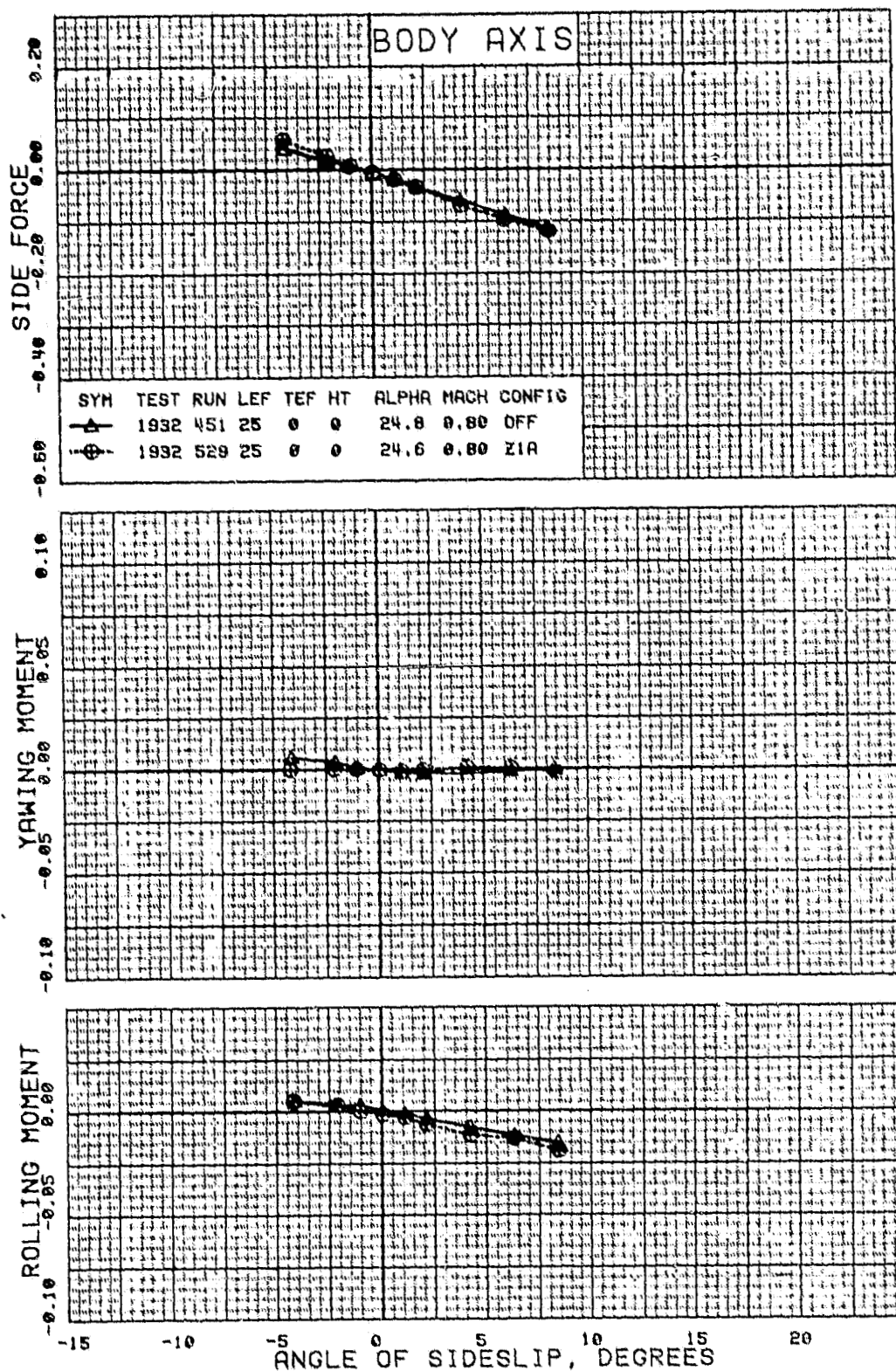


Figure 4-7 (c) Force and Moments, $\alpha = 25^\circ$

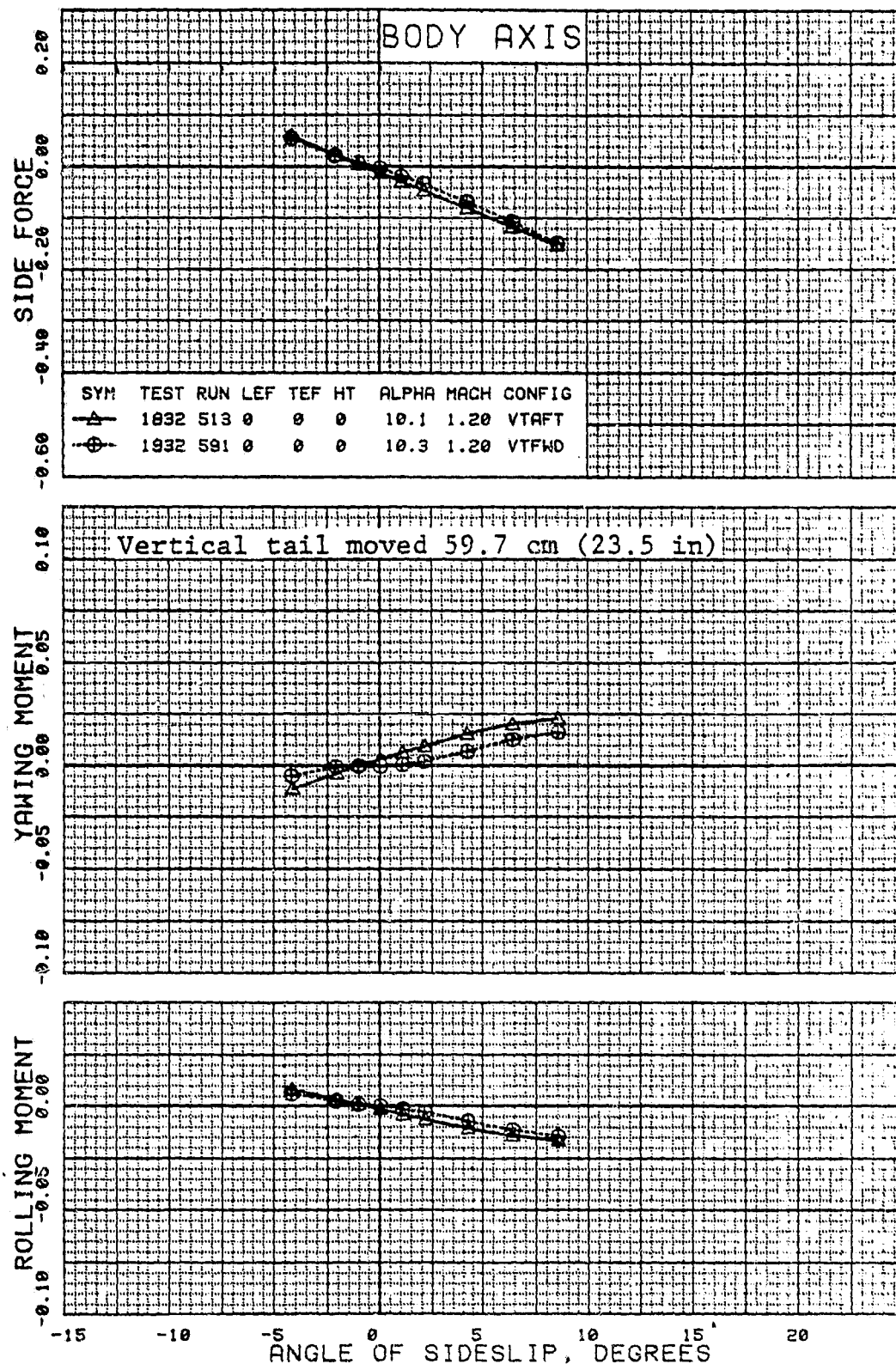


Figure 4-8 Effect of Forward Vertical Tail Movement with Canard Strake Z1A, Configuration 401F-5, $M = 1.20$
 (a) Force and Moments $\alpha = 10^\circ$

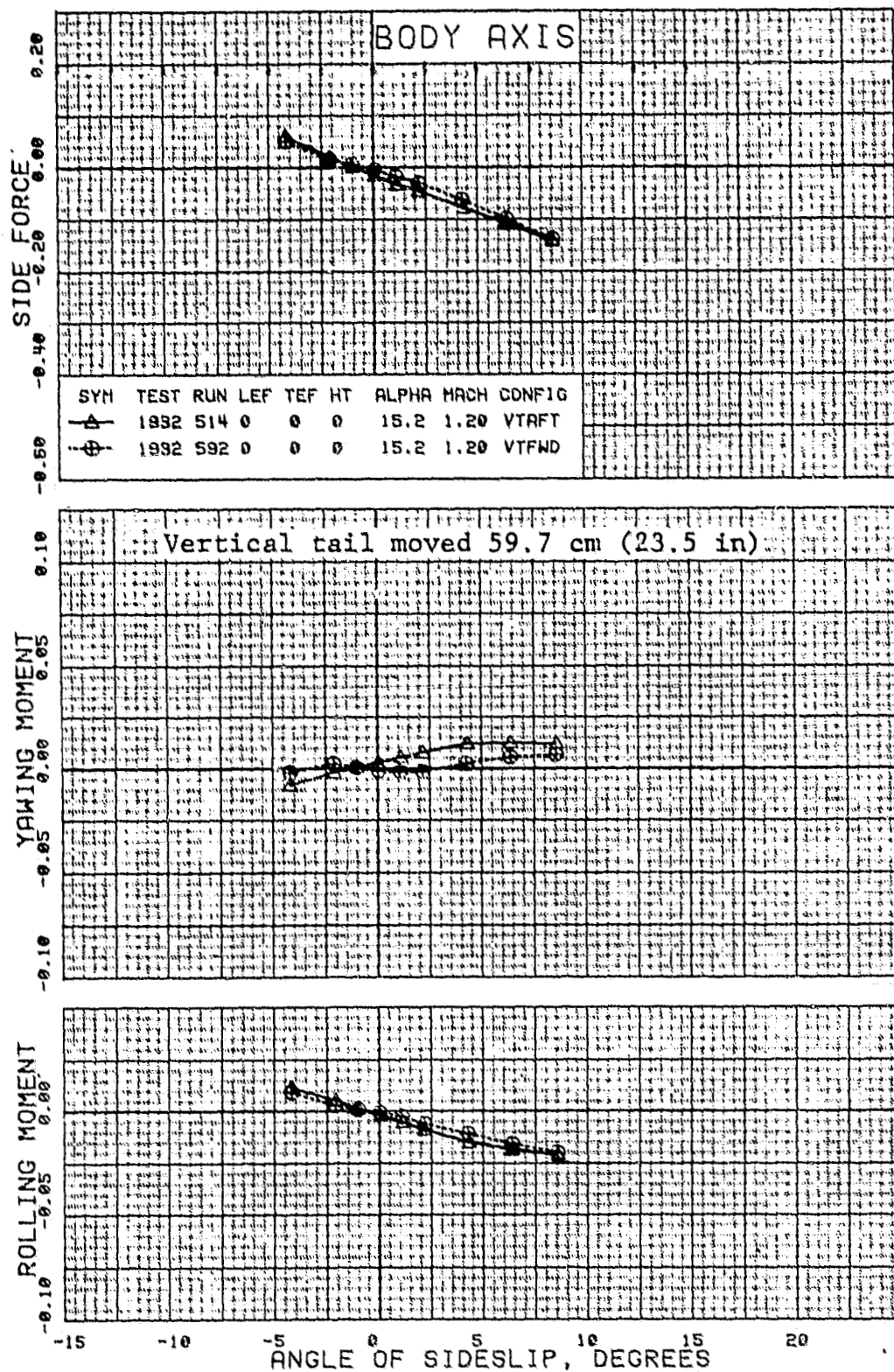


Figure 4-8 (b) Force and Moments $\alpha = 15^\circ$

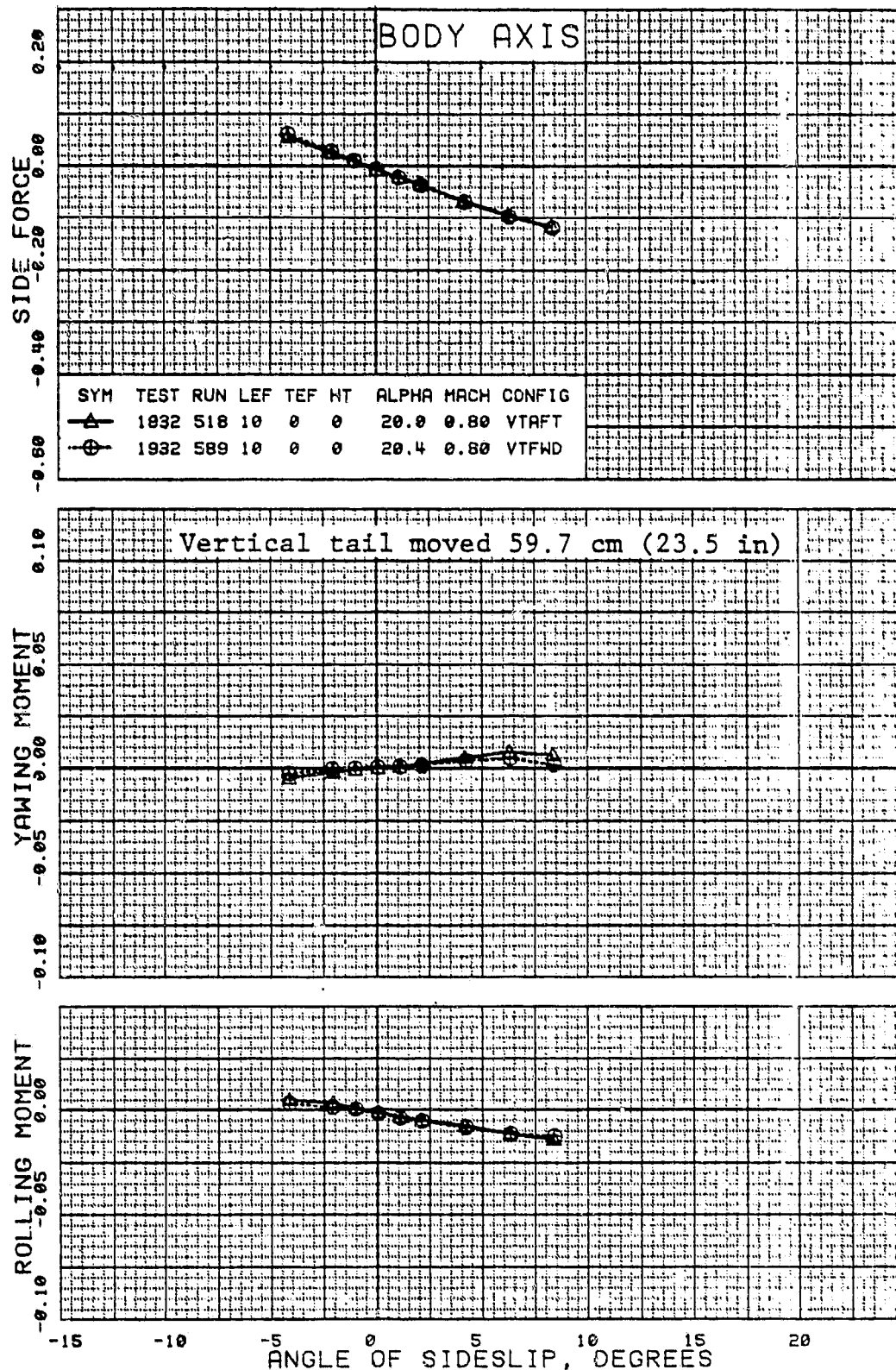


Figure 4-9 Effect of Forward Vertical Tail Movement with Canard Strake Z1A, Configuration 401F-5, LEF = 10°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

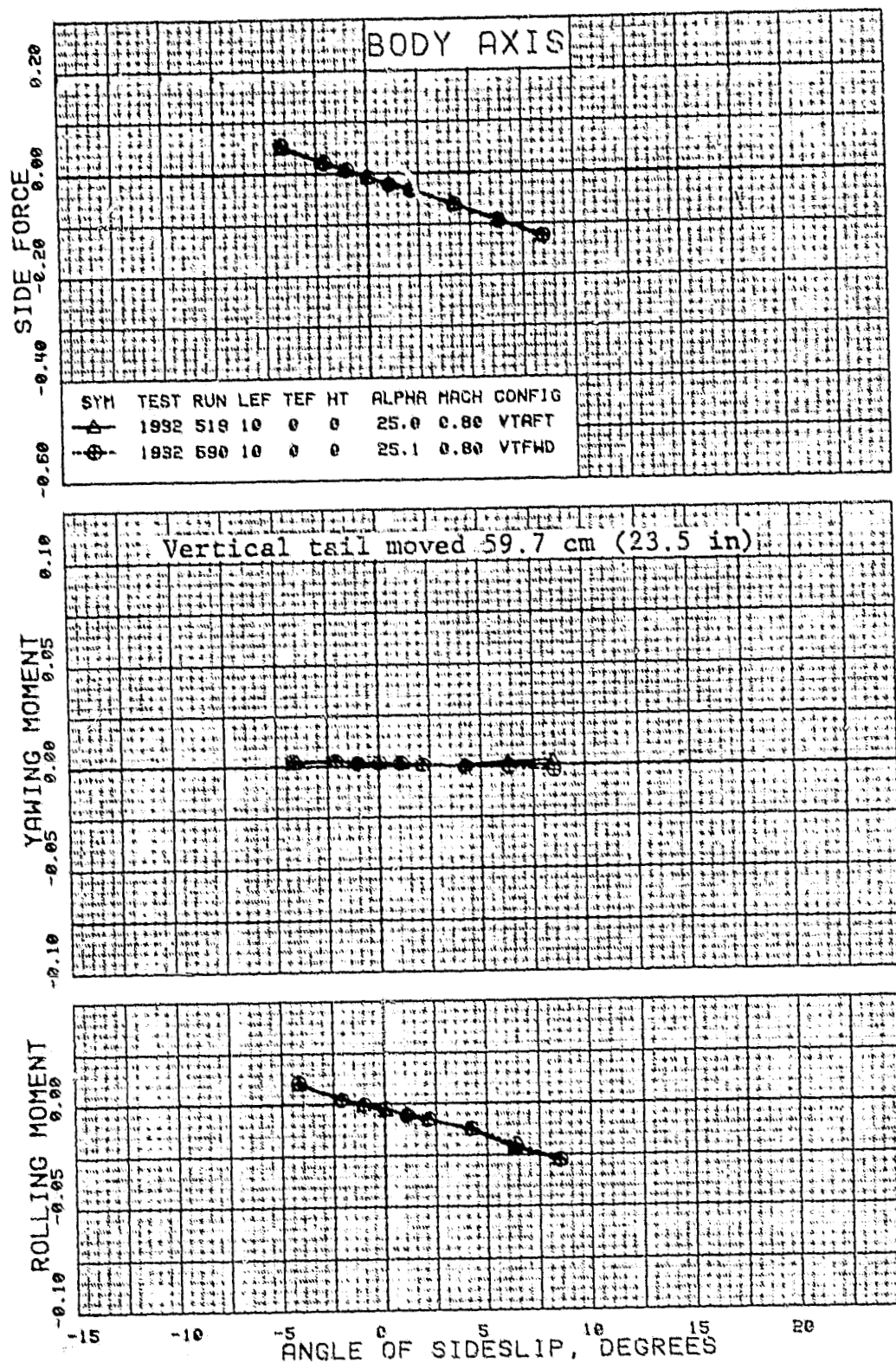


Figure 4-9 (b) Force and Moments, $\alpha = 25^\circ$

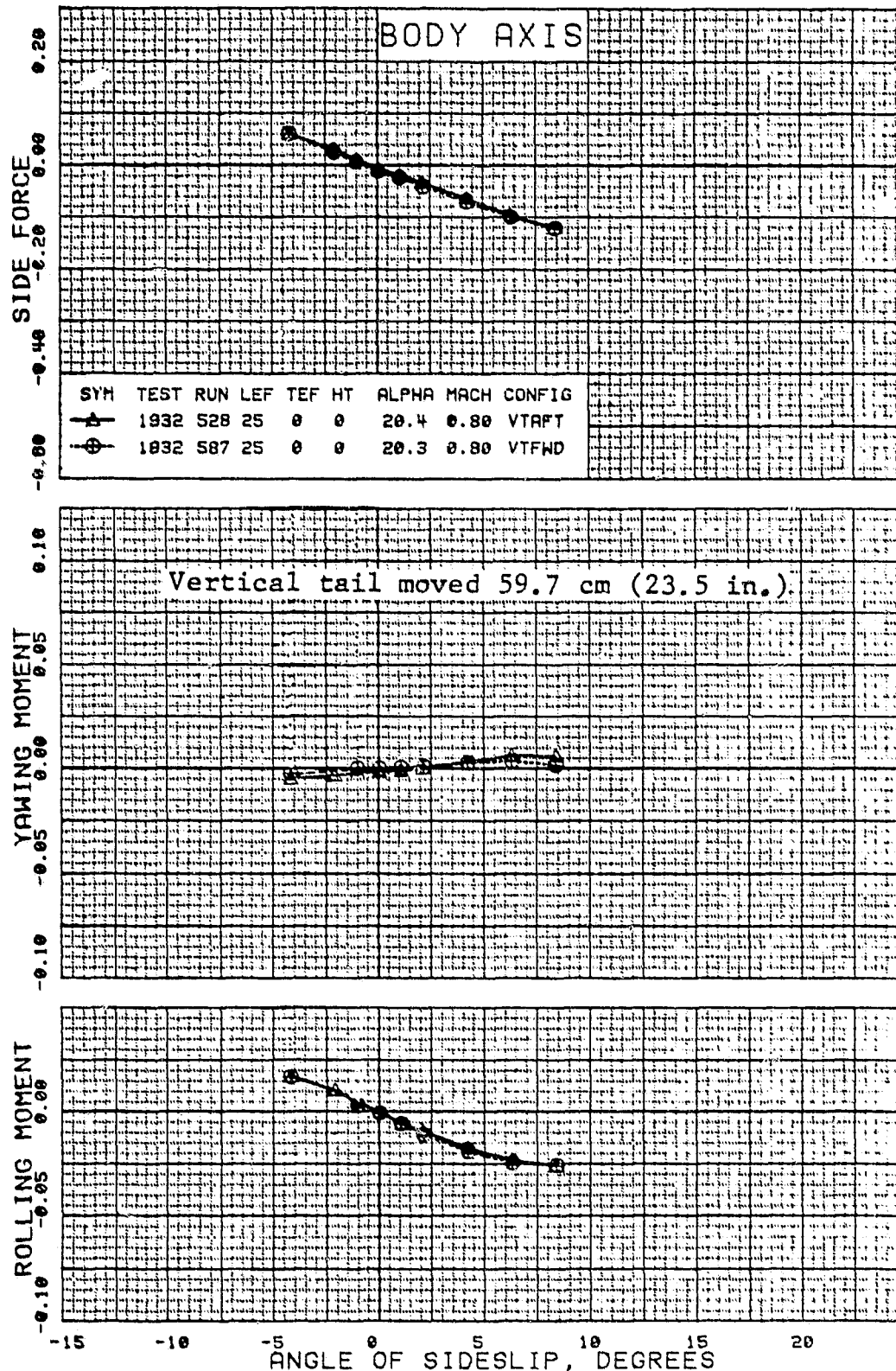


Figure 4-10 Effect of Forward Vertical Tail Movement with Canard Stroke Z1A, Configuration 401F-5, LEF = 25°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

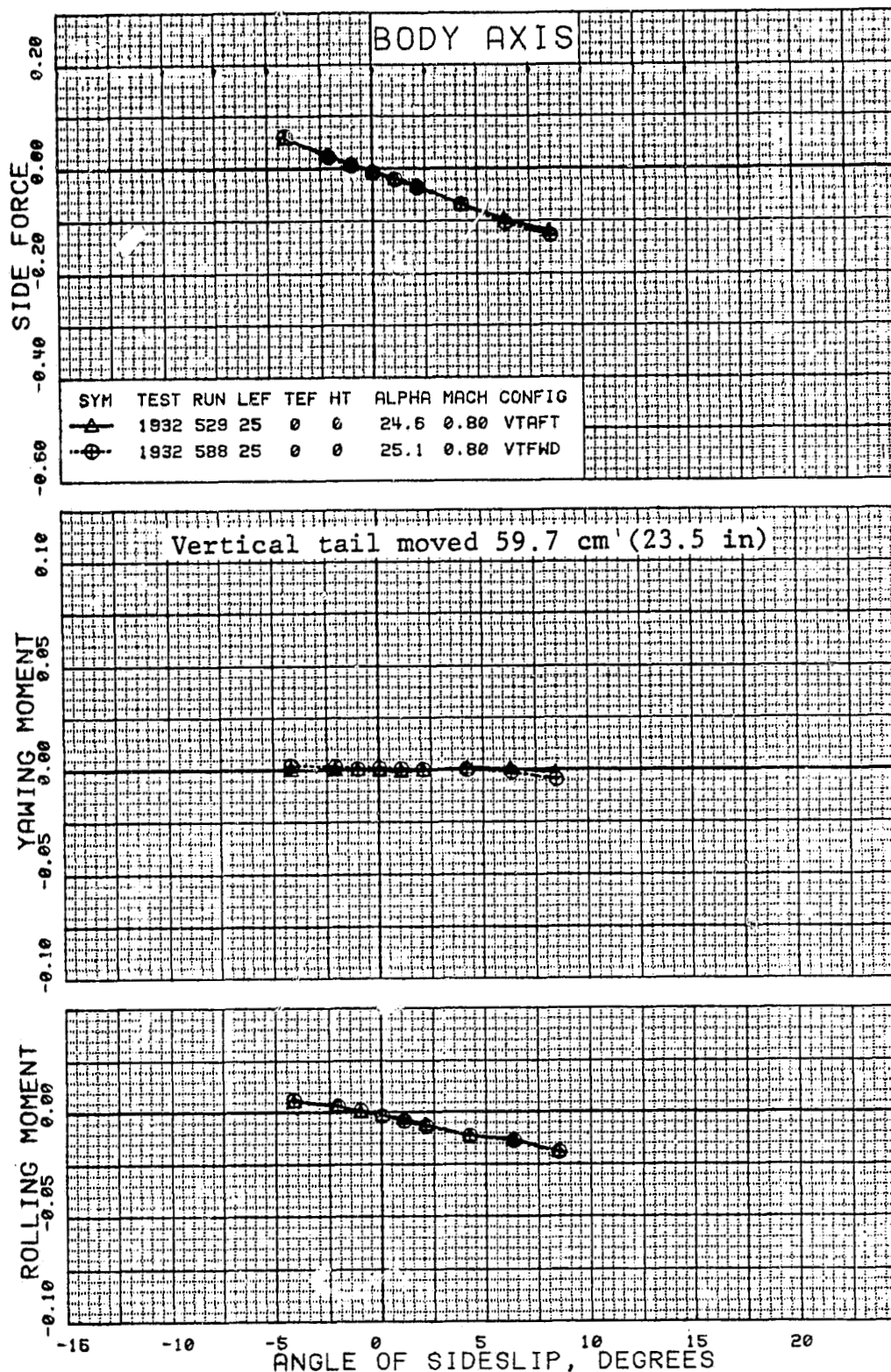


Figure 4-10 (b) Force and Moments, $\alpha = 25^\circ$

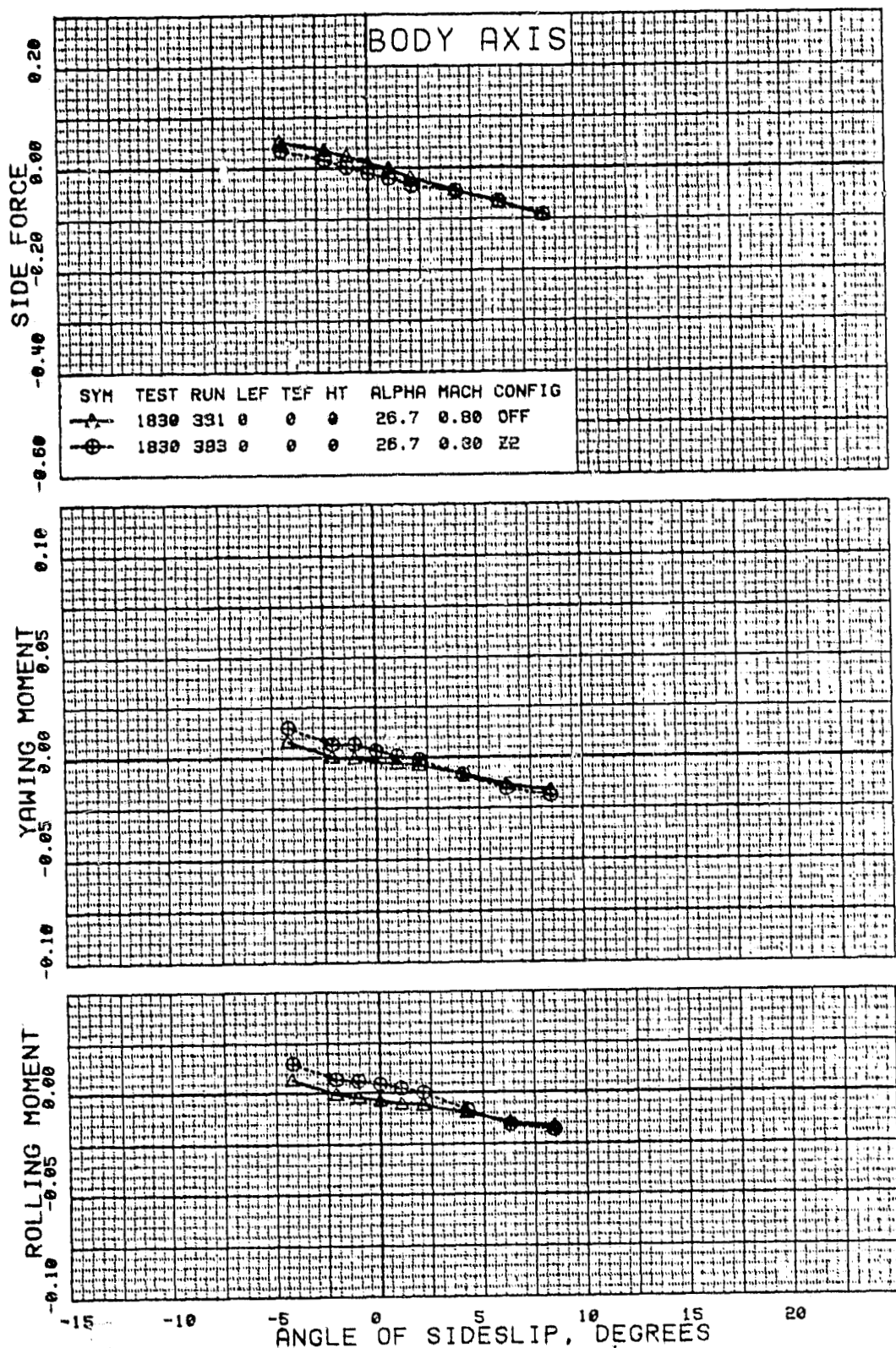


Figure 4-11 Effect of Canard Strake Z2, Configuration 401F-2 with Twin Vertical Tails, $M = 0.80$

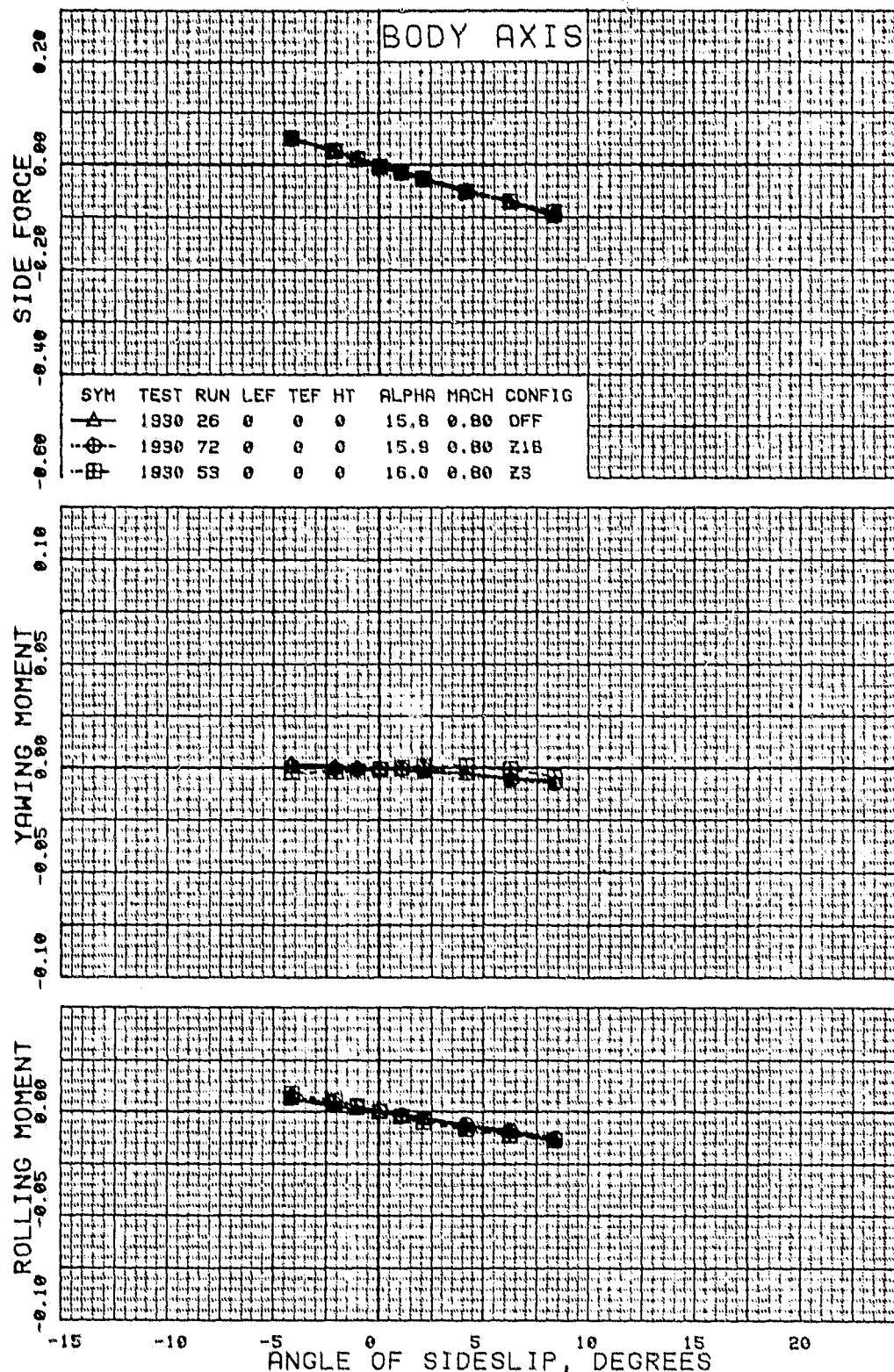


Figure 4-12 Effect of Canard Strakes Z1B and Z3,
Configuration 401F-4, M = 0.80
(a) Force and Moments, $\alpha = 16^\circ$

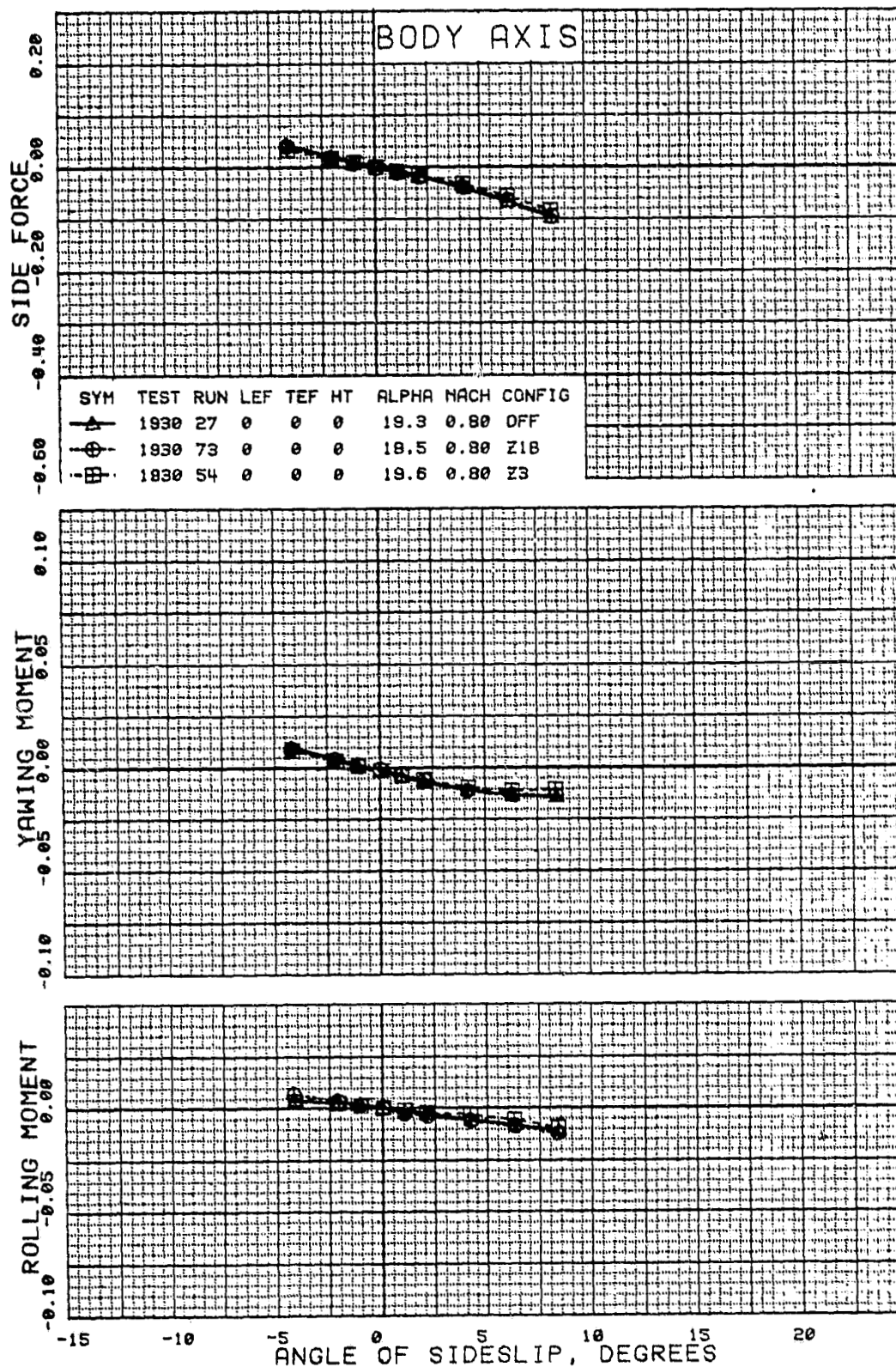


Figure 4-12 (b) Force and Moments, $\alpha = 19^\circ$

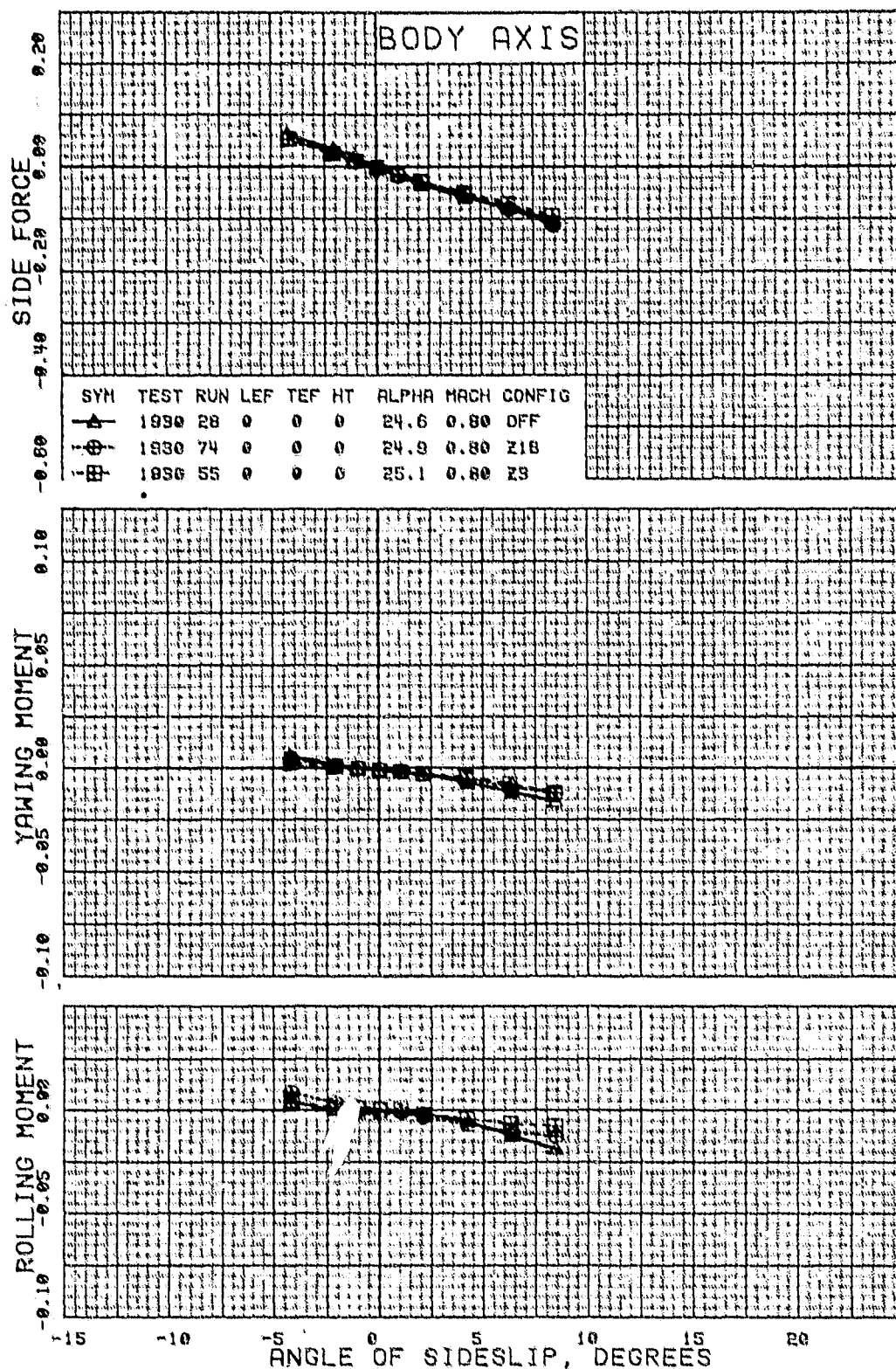


Figure 4-12 (c) Force and Moments, $\alpha = 25^\circ$

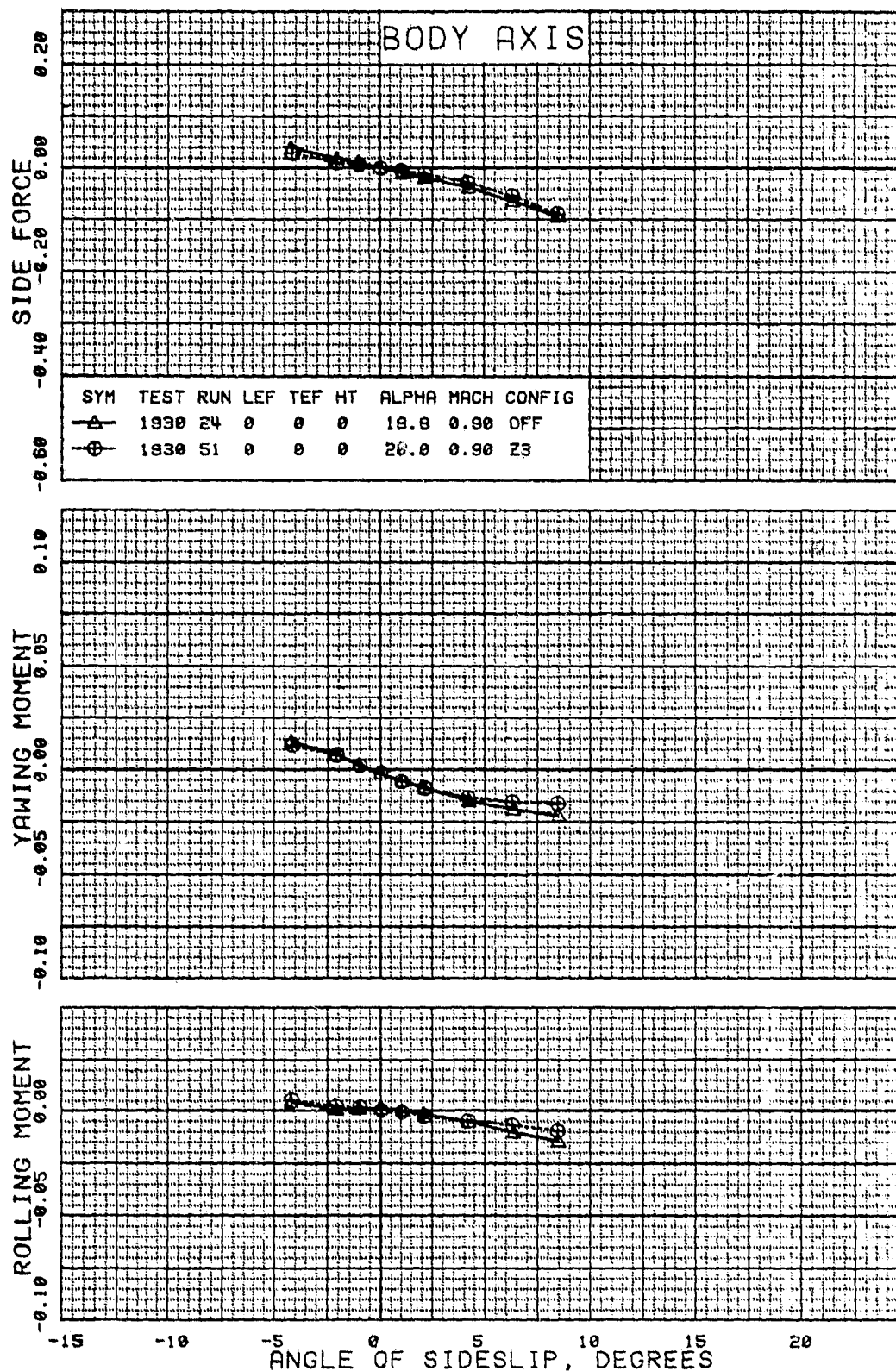


Figure 4-13 Effect of Canard Strake Z3, Configuration 401F-4, $M = 0.90$

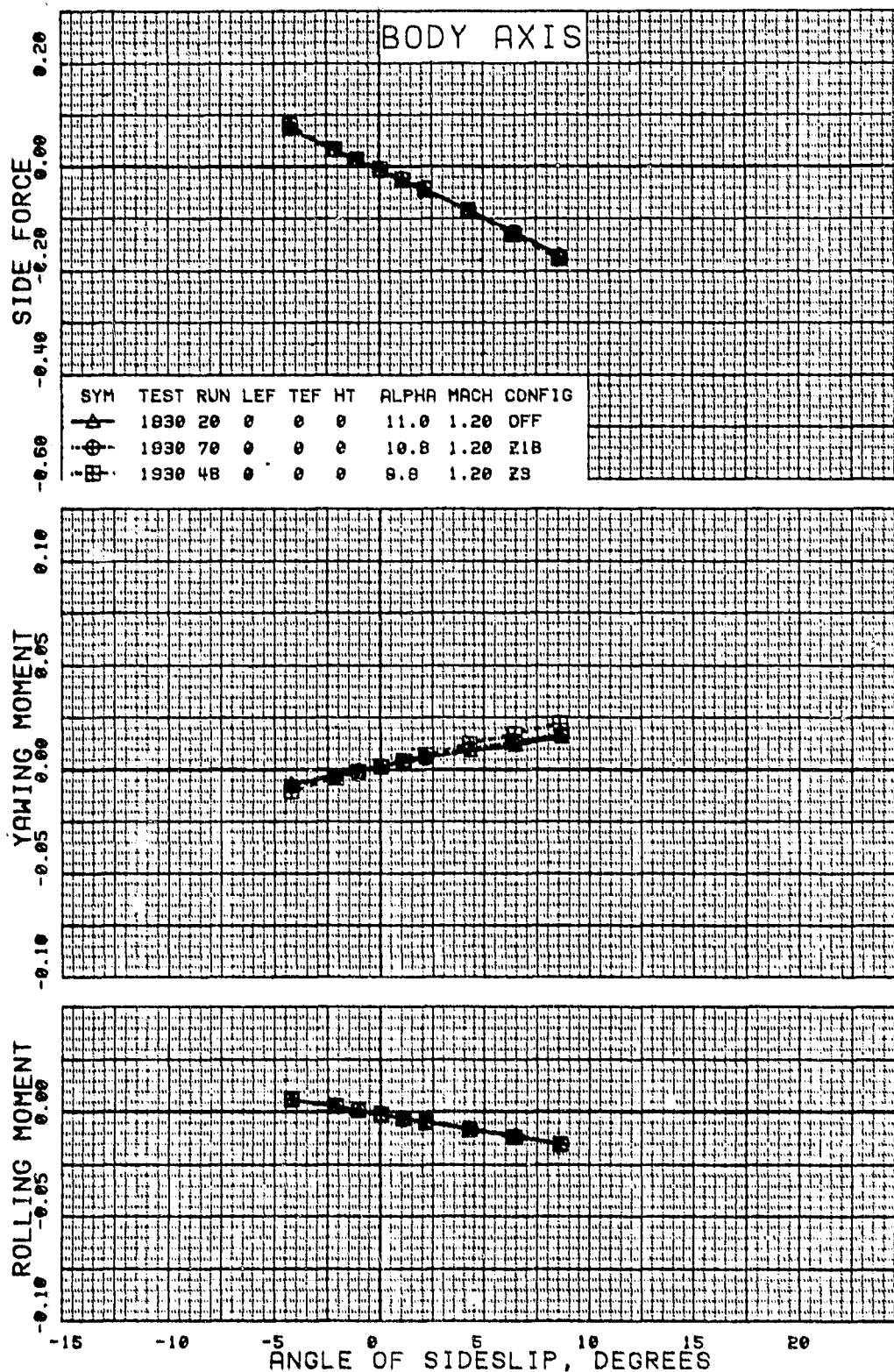


Figure 4-14 Effect of Canard Strakes Z1B and Z3,
Configuration 401F-4, $M = 1.20$
(a) Force and Moments, $\alpha = 11^\circ$

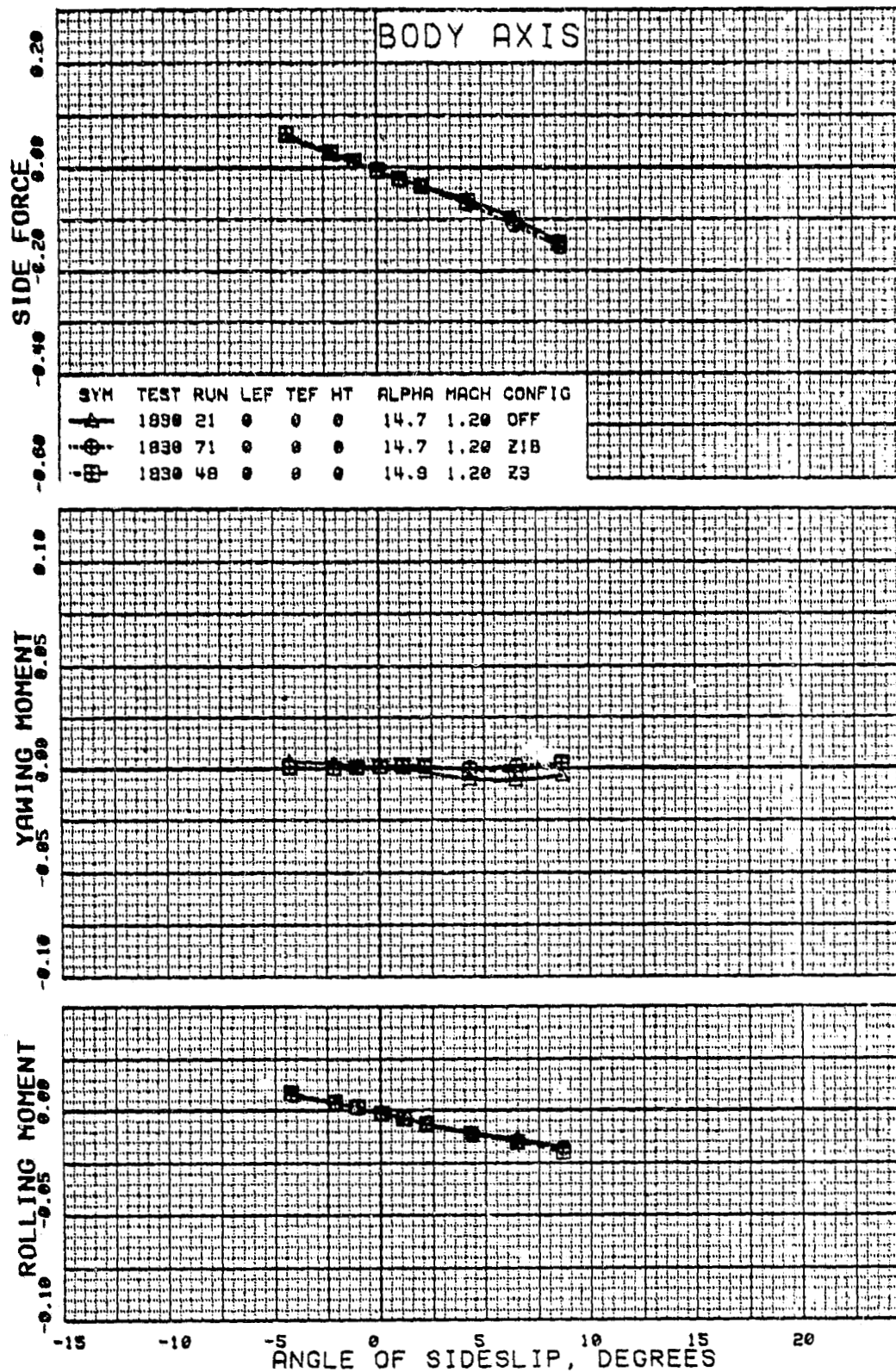


Figure 4-14 (b) Force and Moments, $\alpha = 15^\circ$

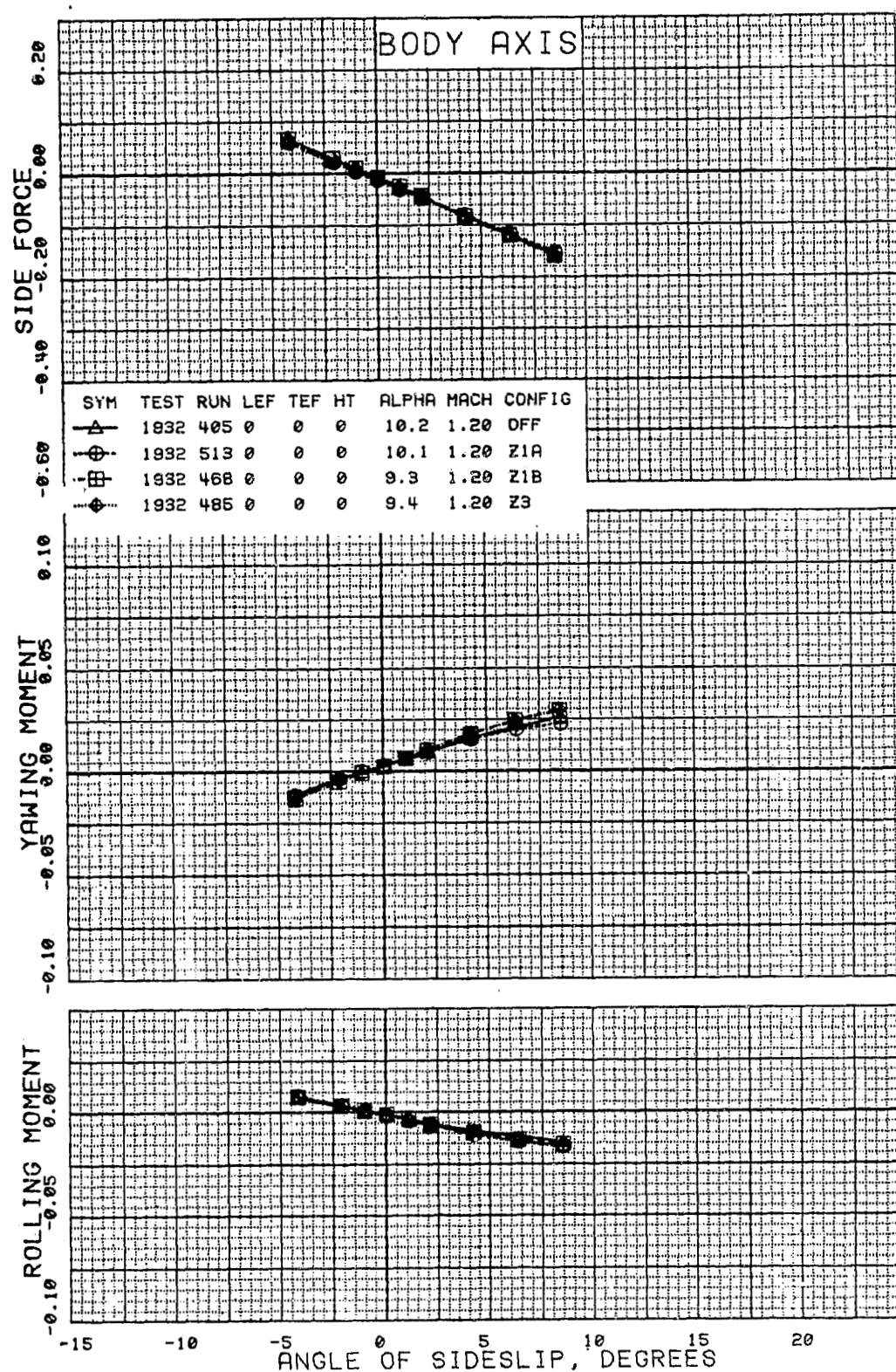


Figure 4-15 Comparison of Canard Strakes (Z1A, Z1B, Z3),
Configuration 401F-5, $M = 1.20$
(a) Force and Moments, $\alpha = 10^\circ$

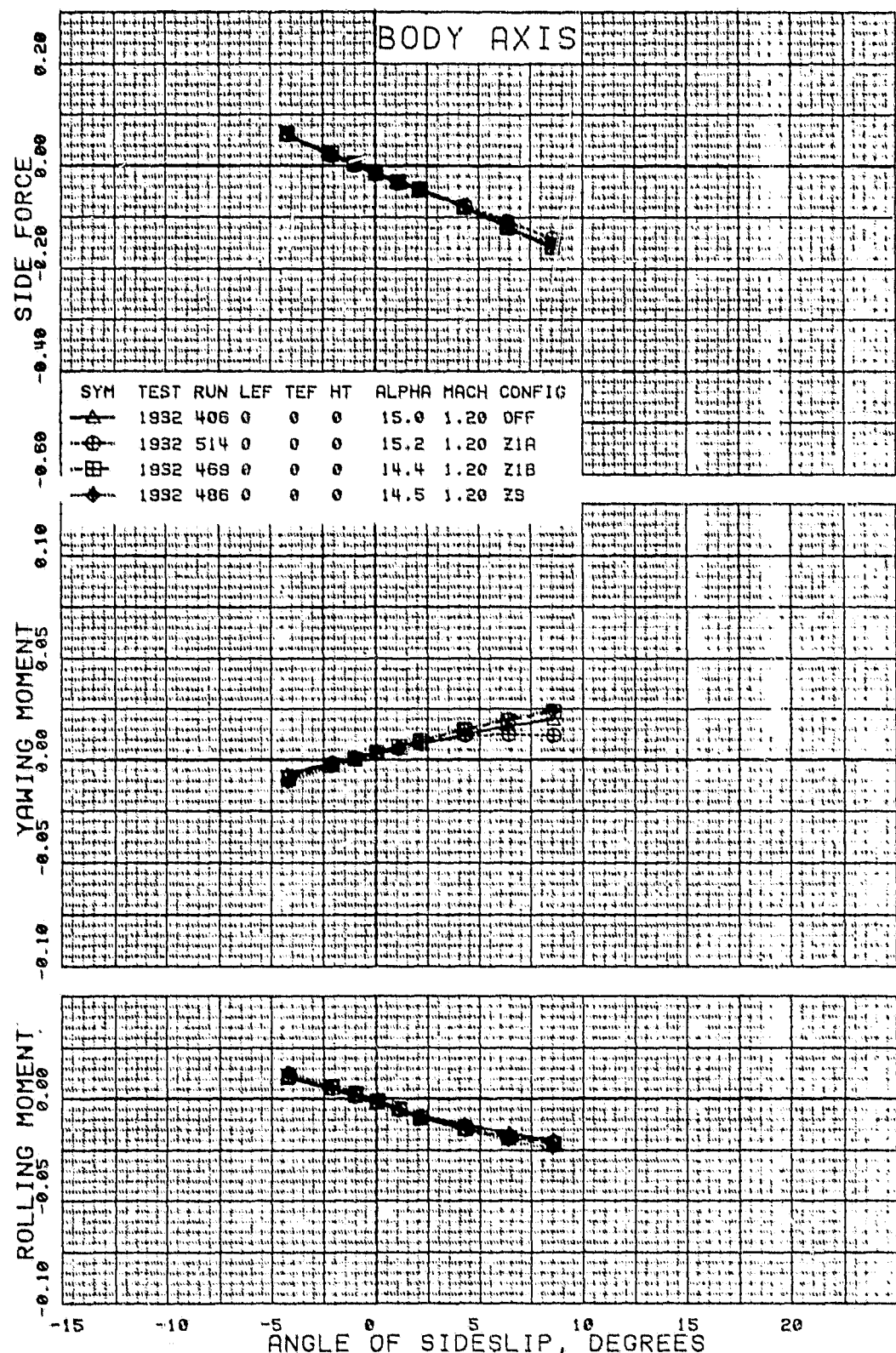


Figure 4-15 (b) Force and Moments, $\alpha = 150^\circ$

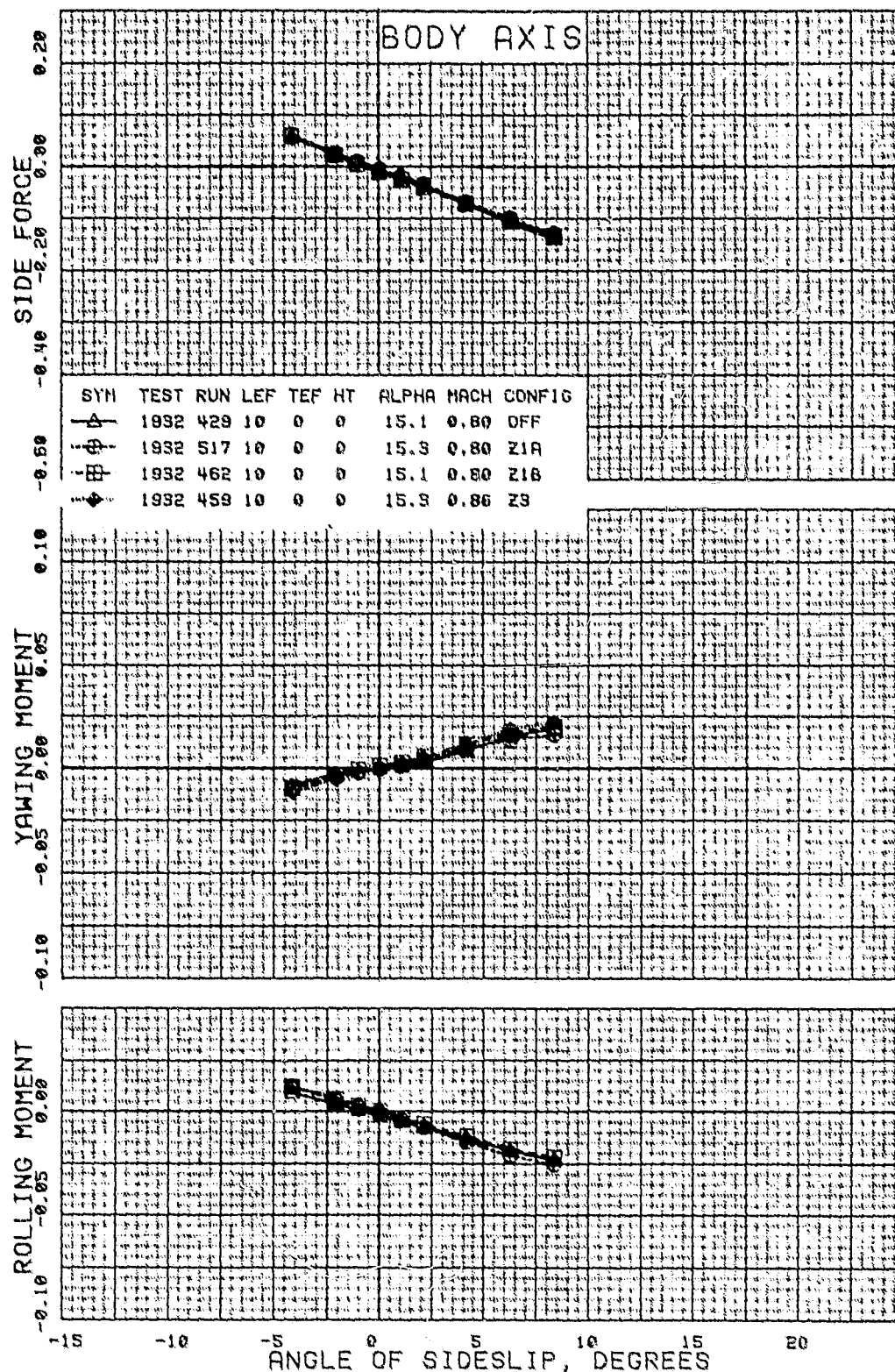


Figure 4-16 Comparison of Canard Strakes (Z1A, Z1B, Z3), Configuration 401F-5, $M = 0.80$
(a) Force and Moments, $\alpha = 15^\circ$

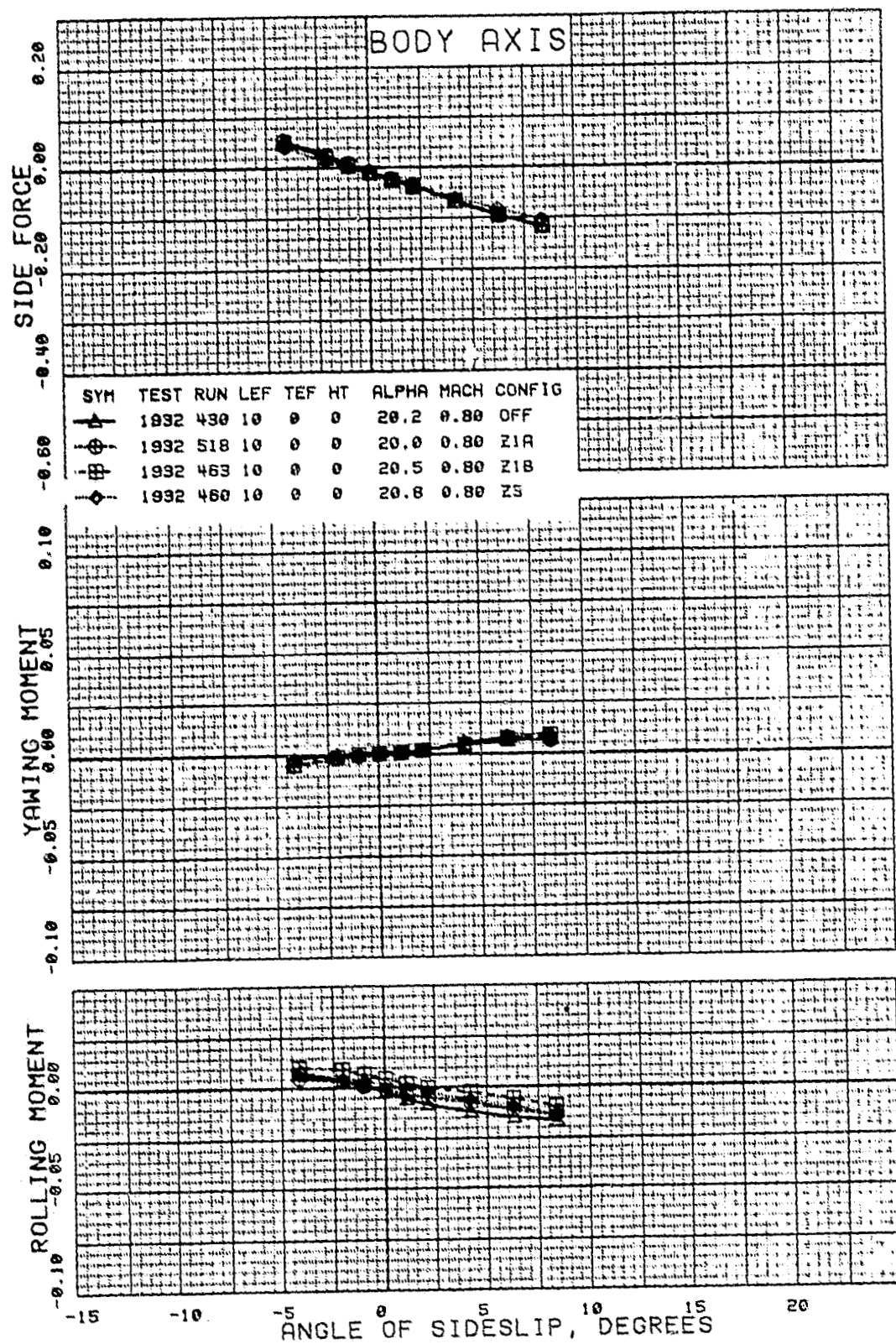


Figure 4-16 (b) Force and Moments, $\alpha = 20^\circ$

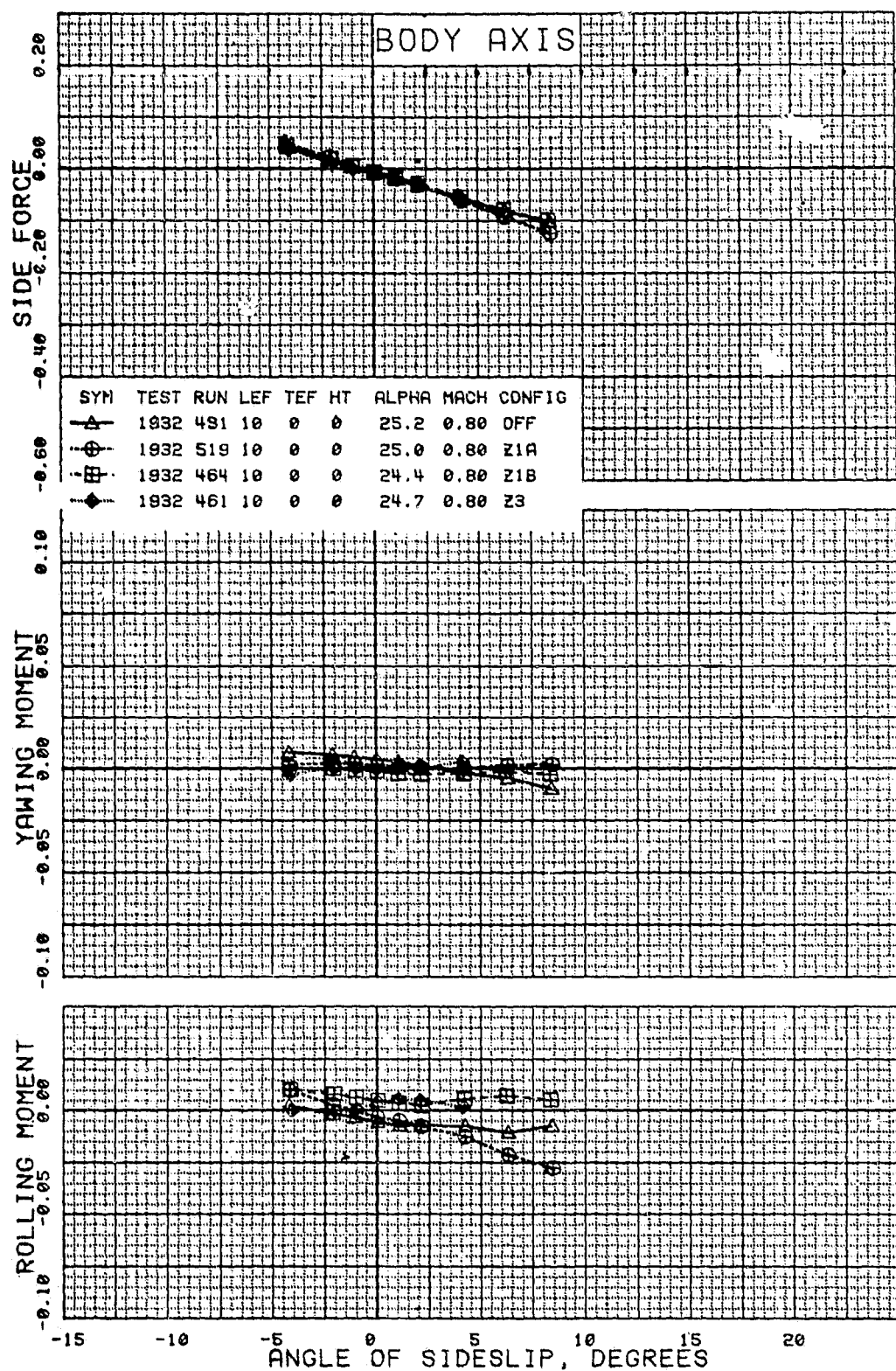


Figure 4-16 (c) Force and Moments, $\alpha = 25^\circ$

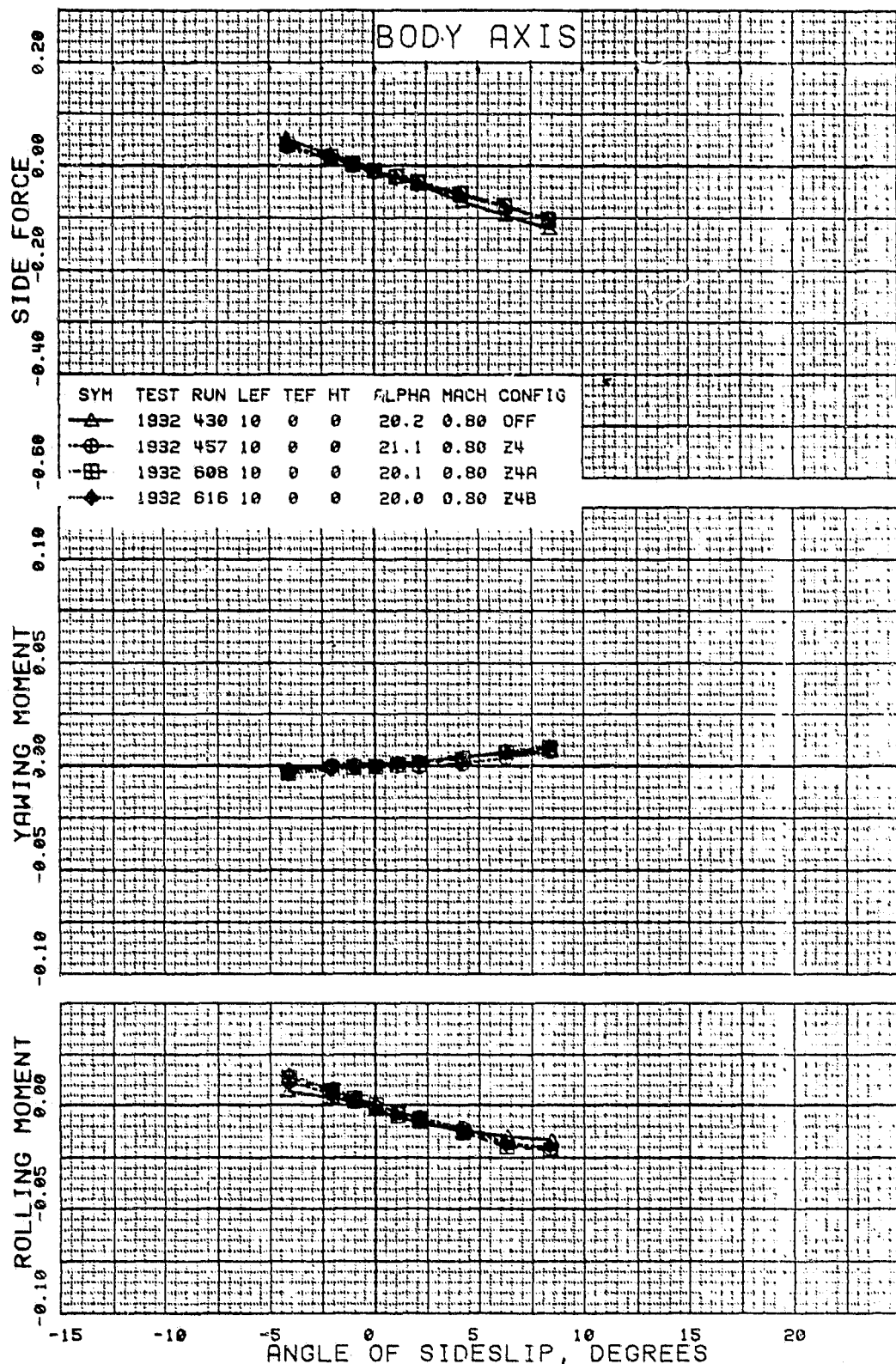


Figure 4-17 Effect of Forebody - Strake Blinding (Z4), Configuration 401F-5, $M = 0.80$
(a) Force and Moments, $\alpha = 20^\circ$

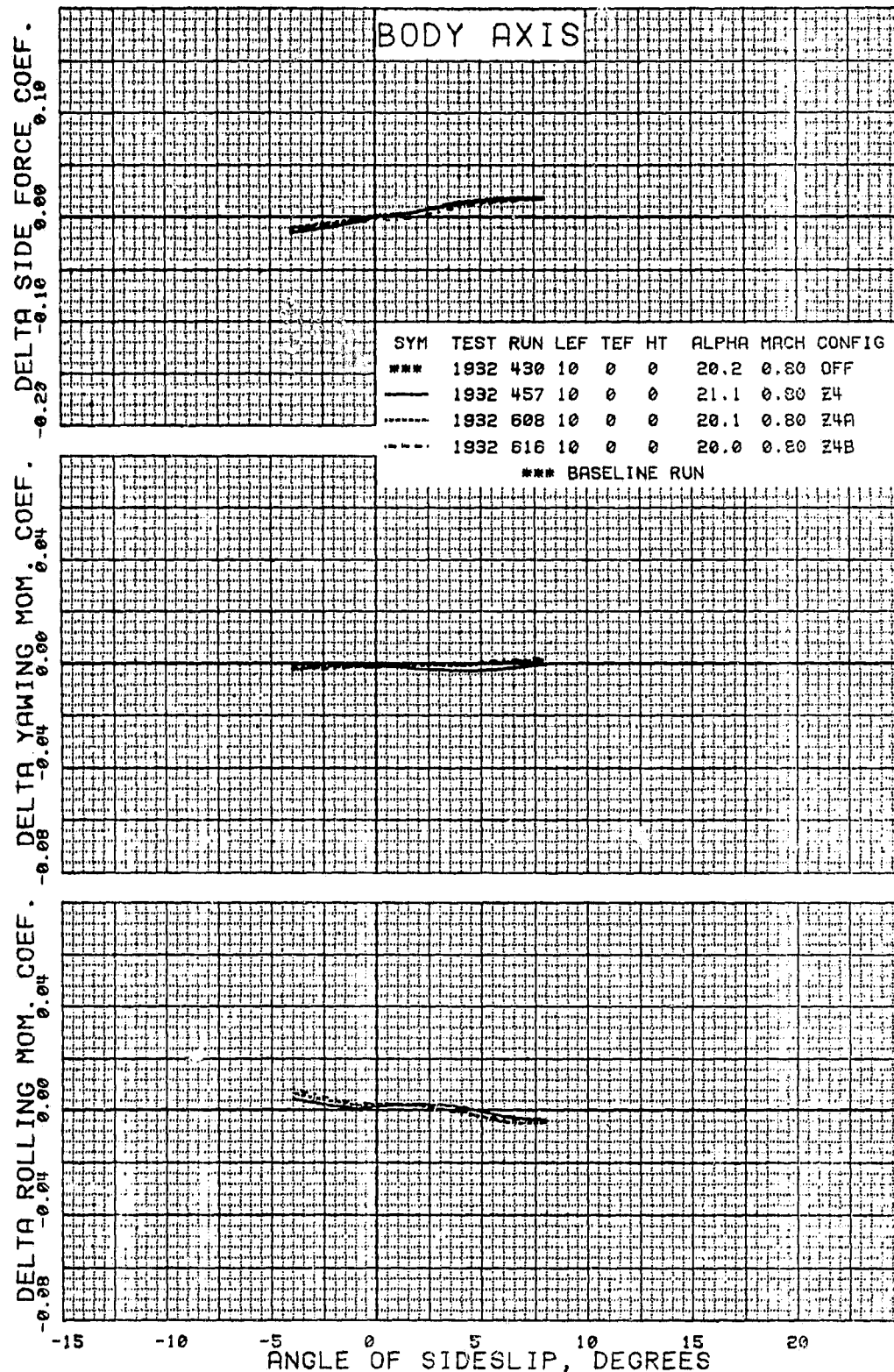


Figure 4-17 (b) Increments, $\alpha = 20^\circ$

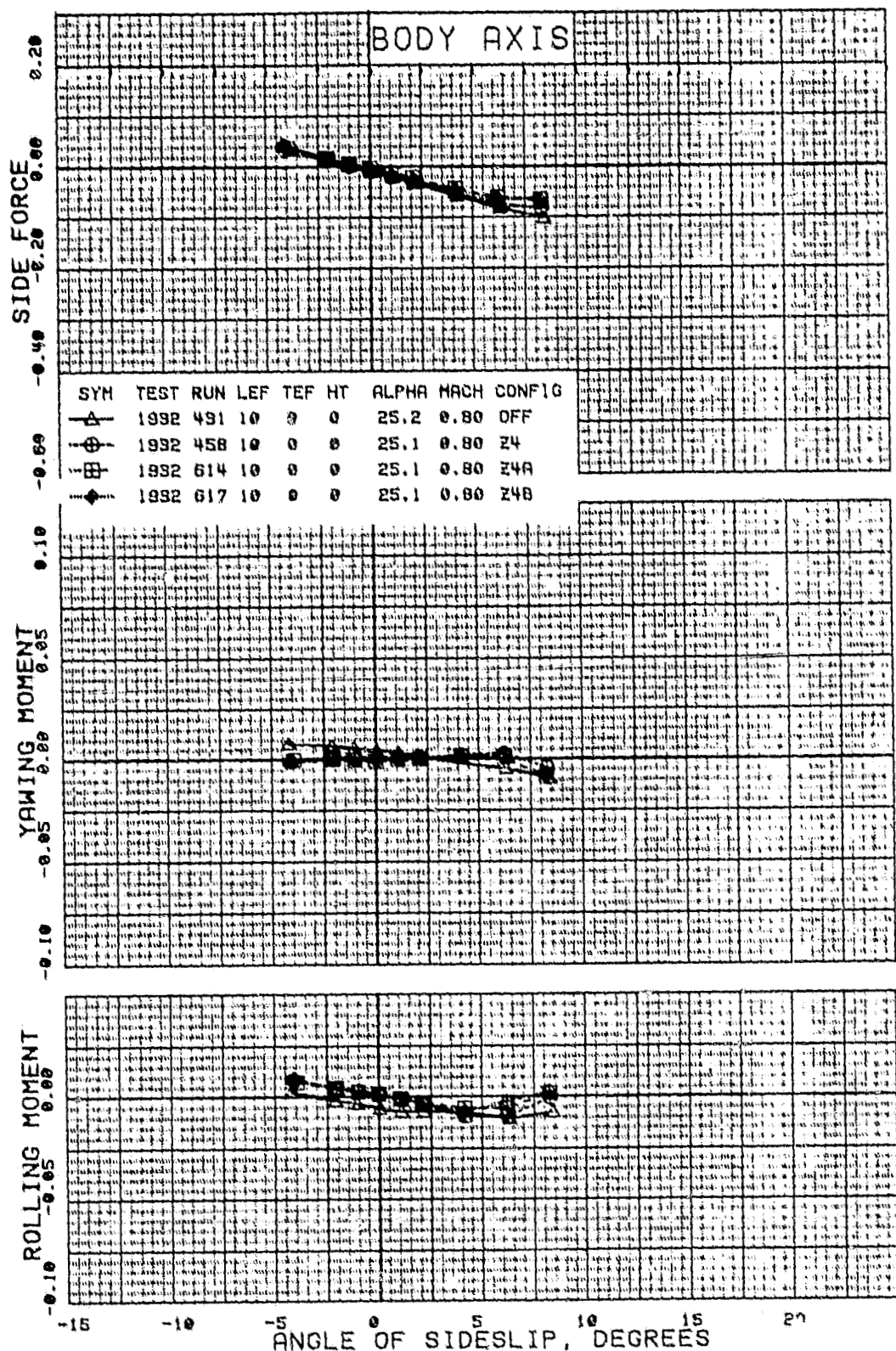


Figure 4-17 (c) Force and Moments, $\alpha = 25^\circ$

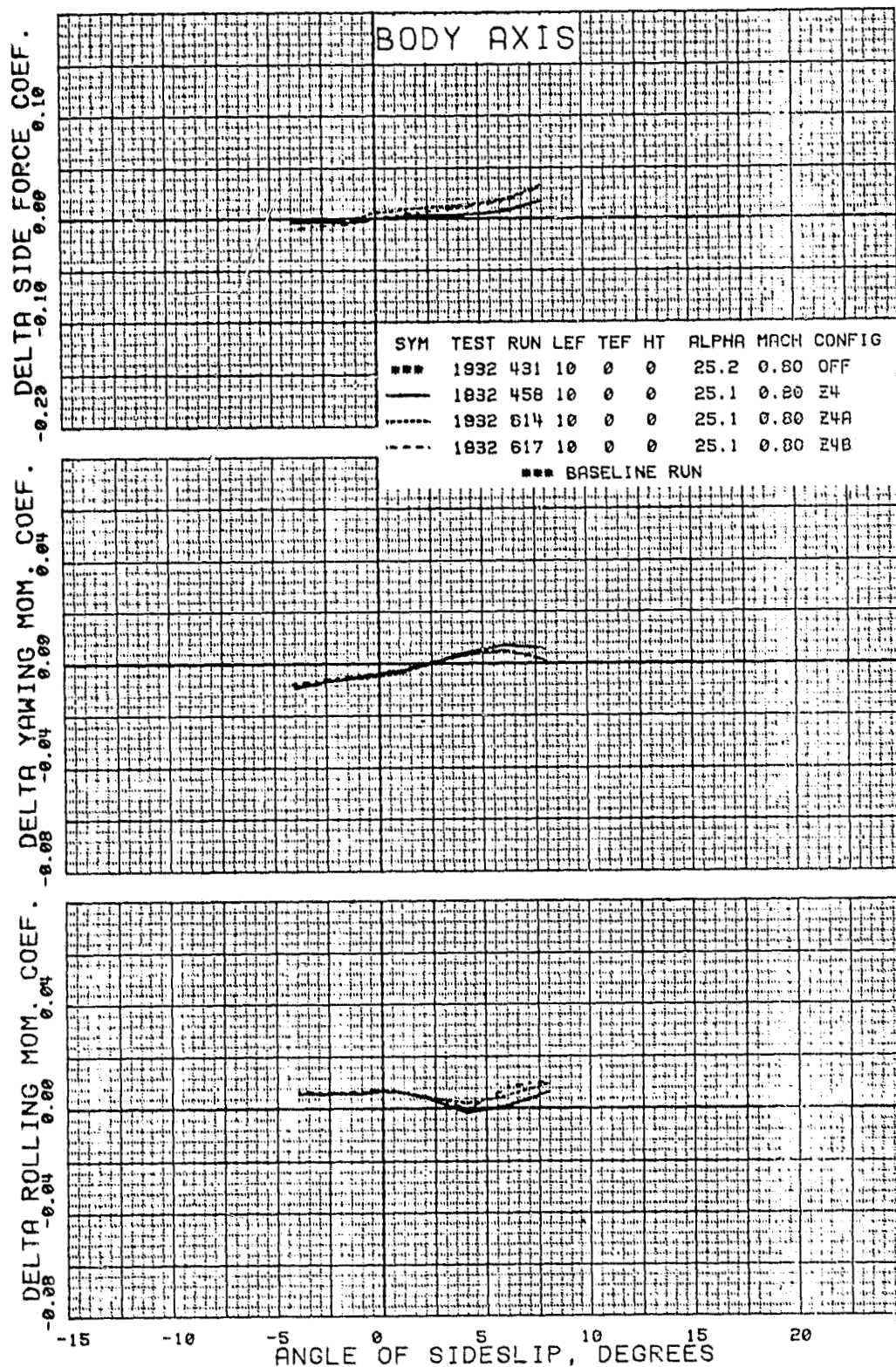


Figure 4-17 (d) Increments, $\alpha = 25^\circ$

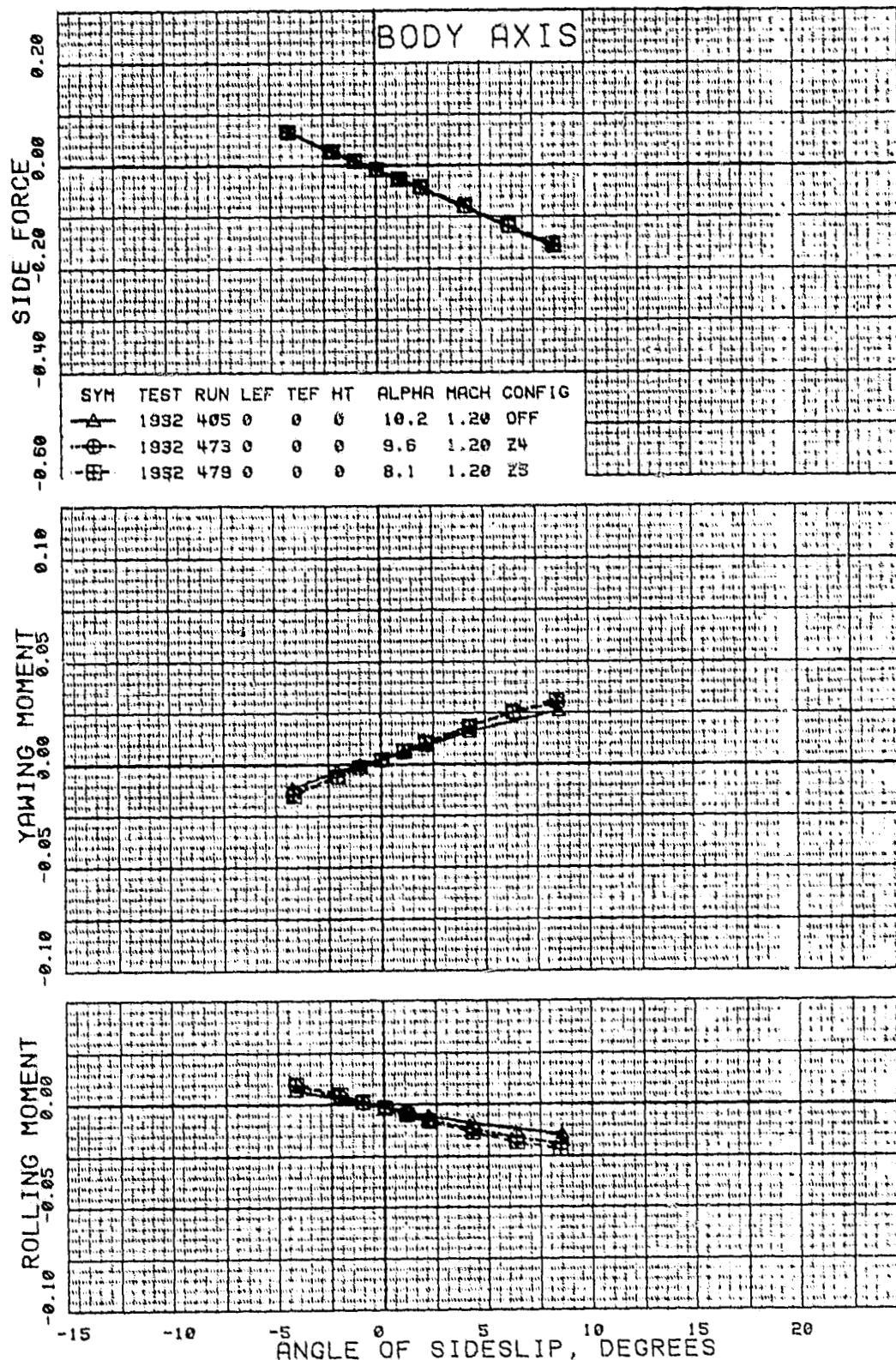


Figure 4-18 Effect of Forebody Strakes Z4 and Z5, Configuration 401F-5, M = 1.20
 (a) Force and Moments, $\alpha = 10^\circ$

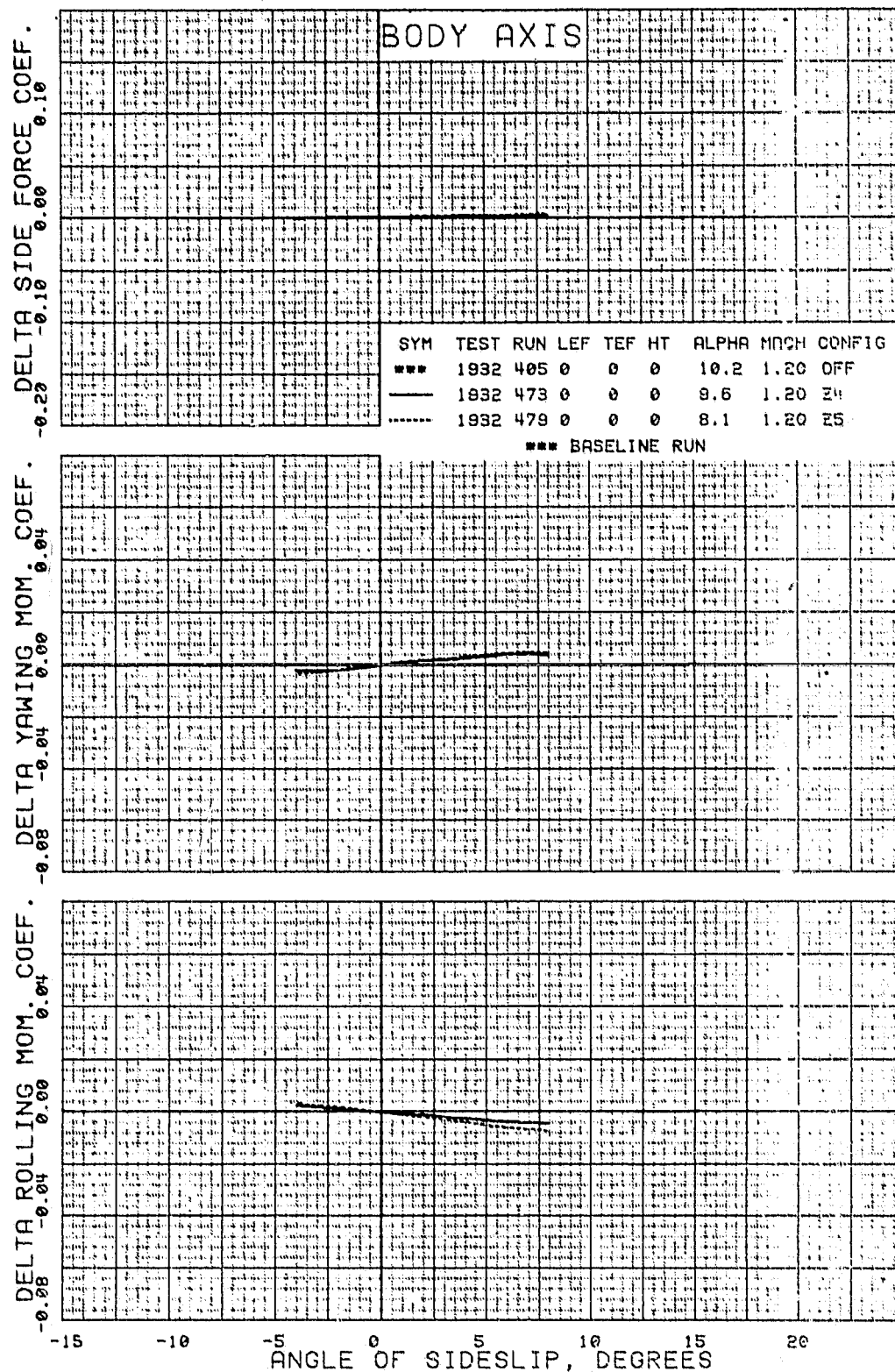


Figure 4-18 (b) Increments, $\alpha = 10^\circ$

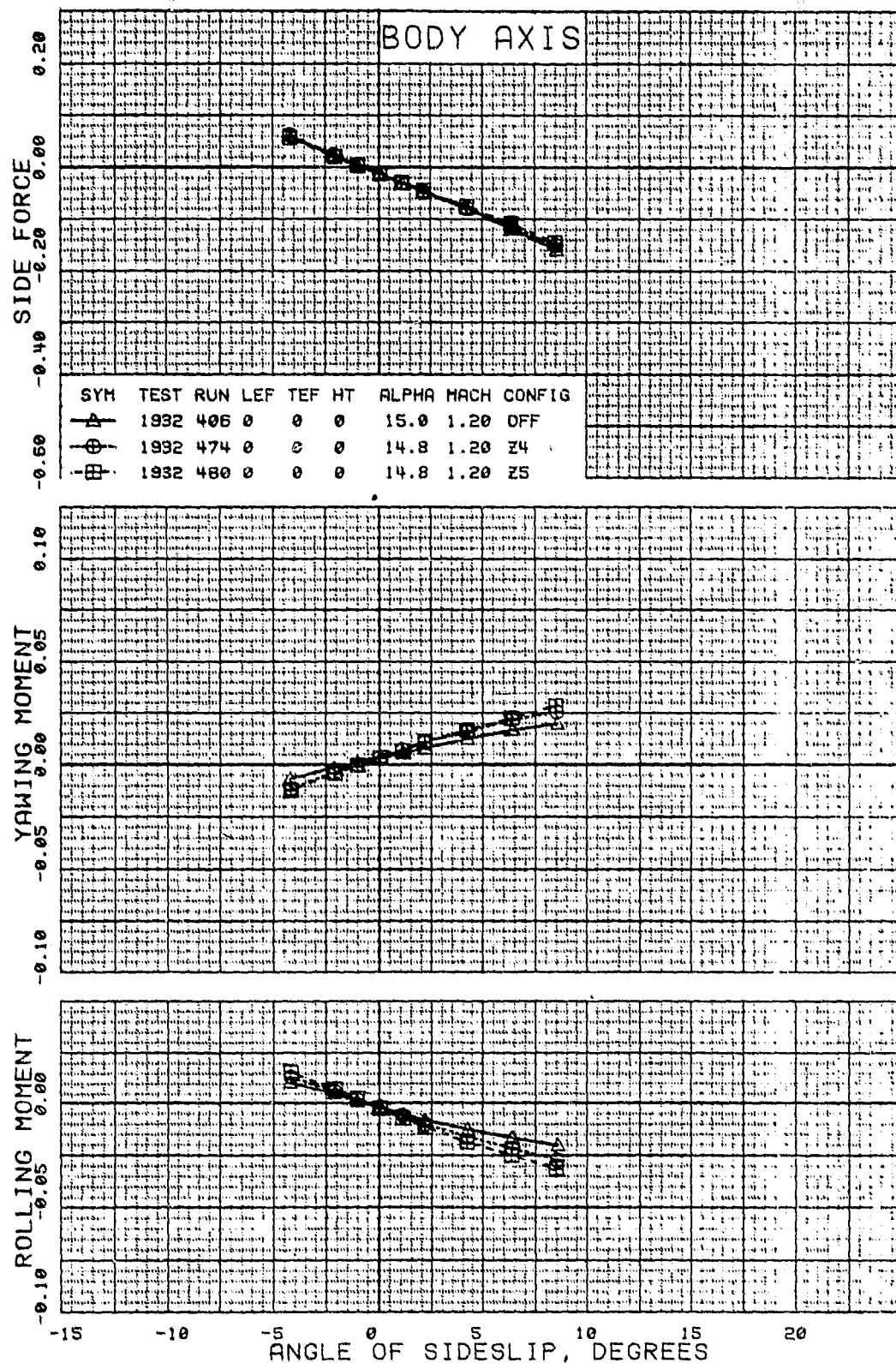


Figure 4-18 (c) Force and Moments, $\alpha = 15^\circ$

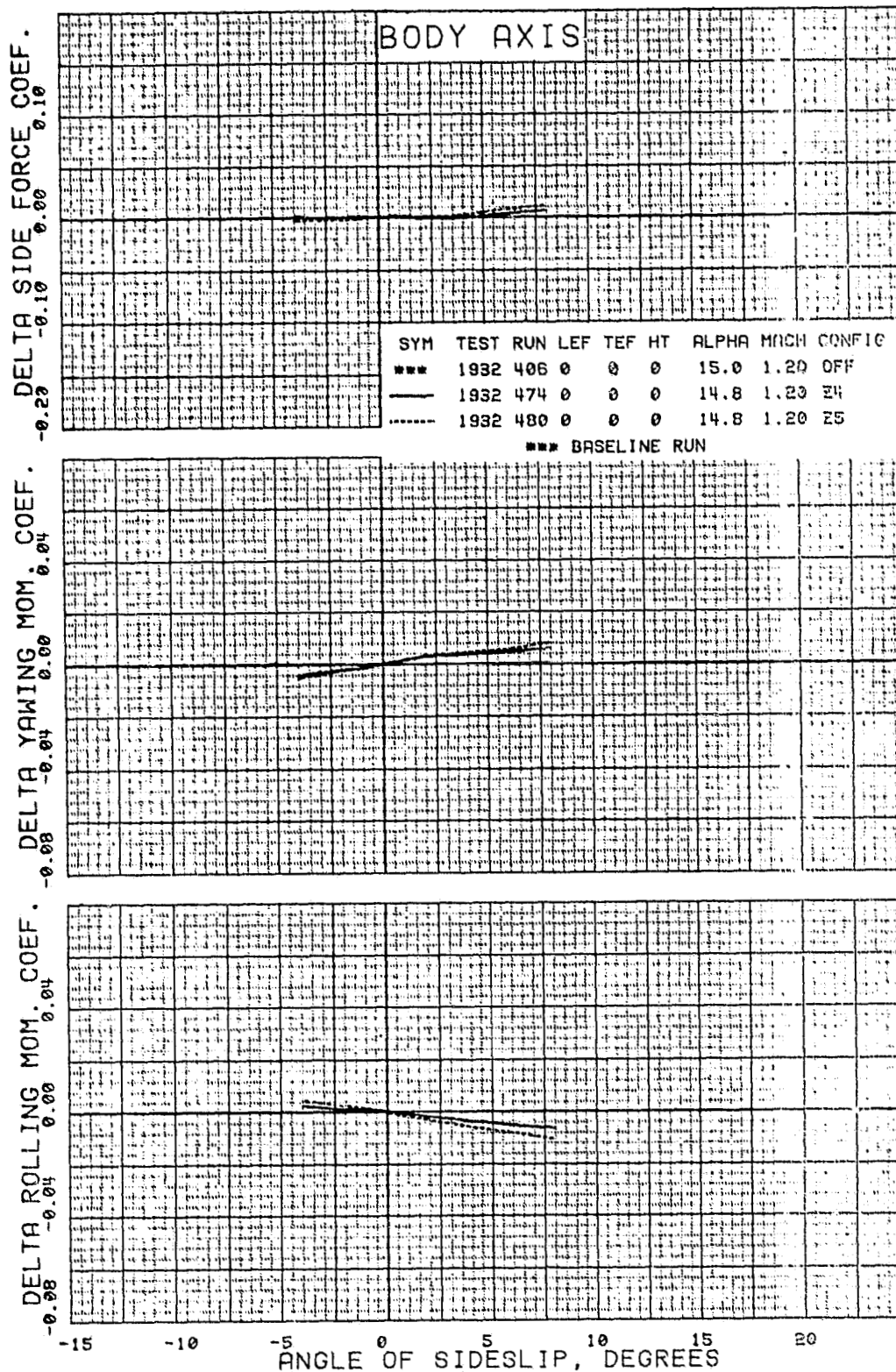


Figure 4-18 (d) Increments, $\alpha = 15^\circ$

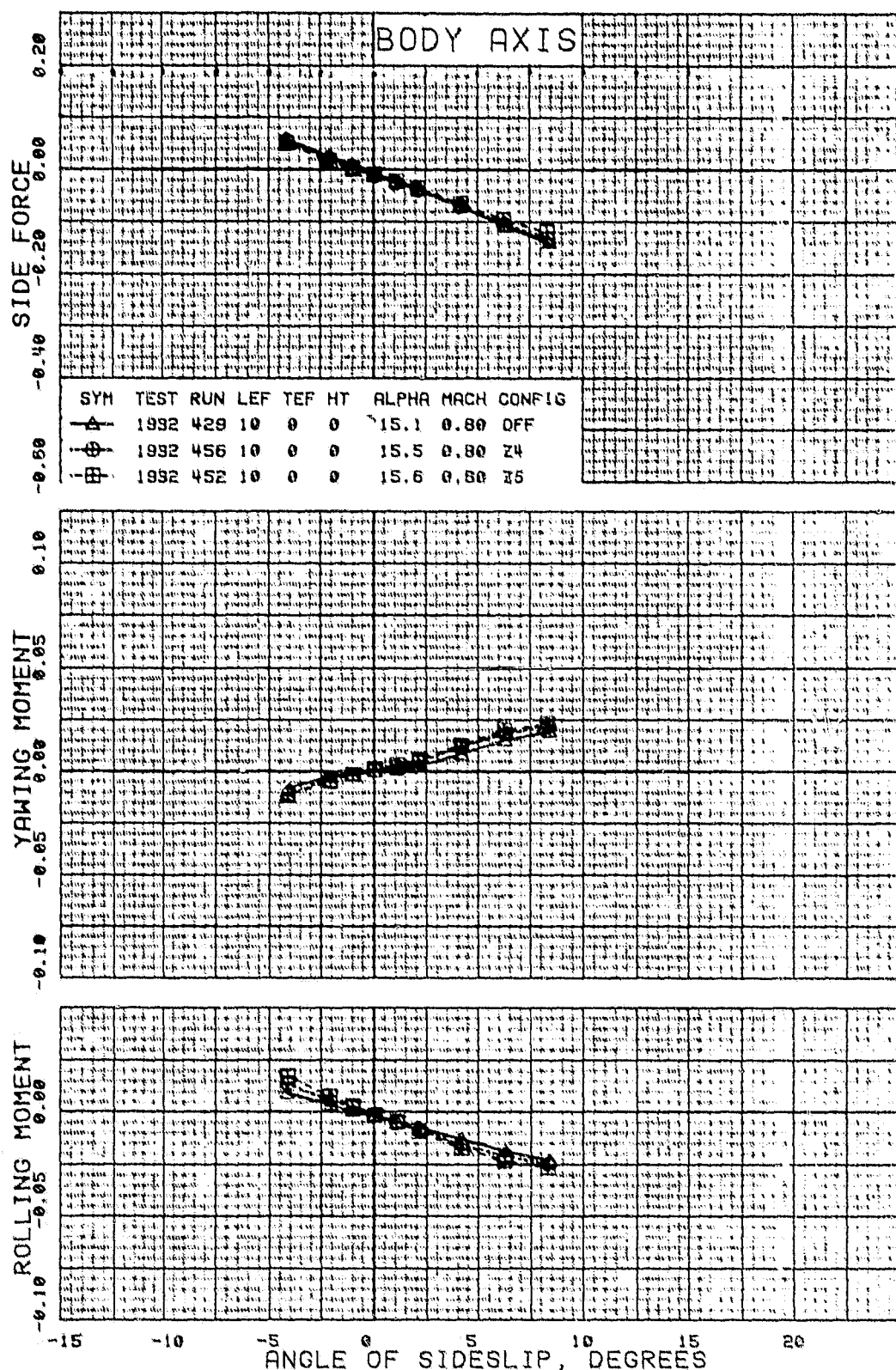


Figure 4-19 Effect of Forebody Strakes Z4 and Z5, Configuration 401F-5, LEF = 10° , M = 0.80 (a) Force and Moments, $\alpha = 15^\circ$

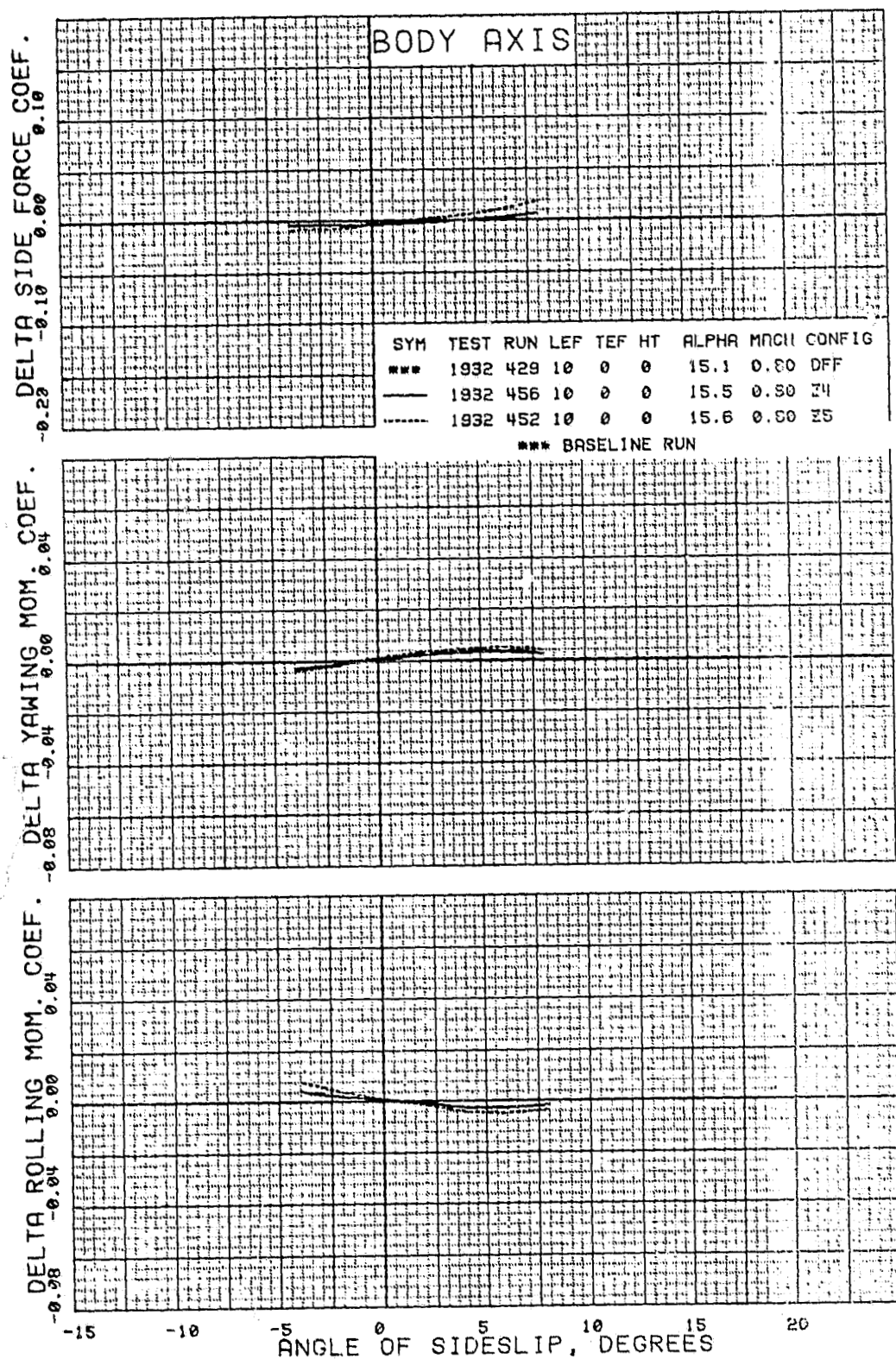


Figure 4-19 (b) Increments, $\alpha = 15^\circ$

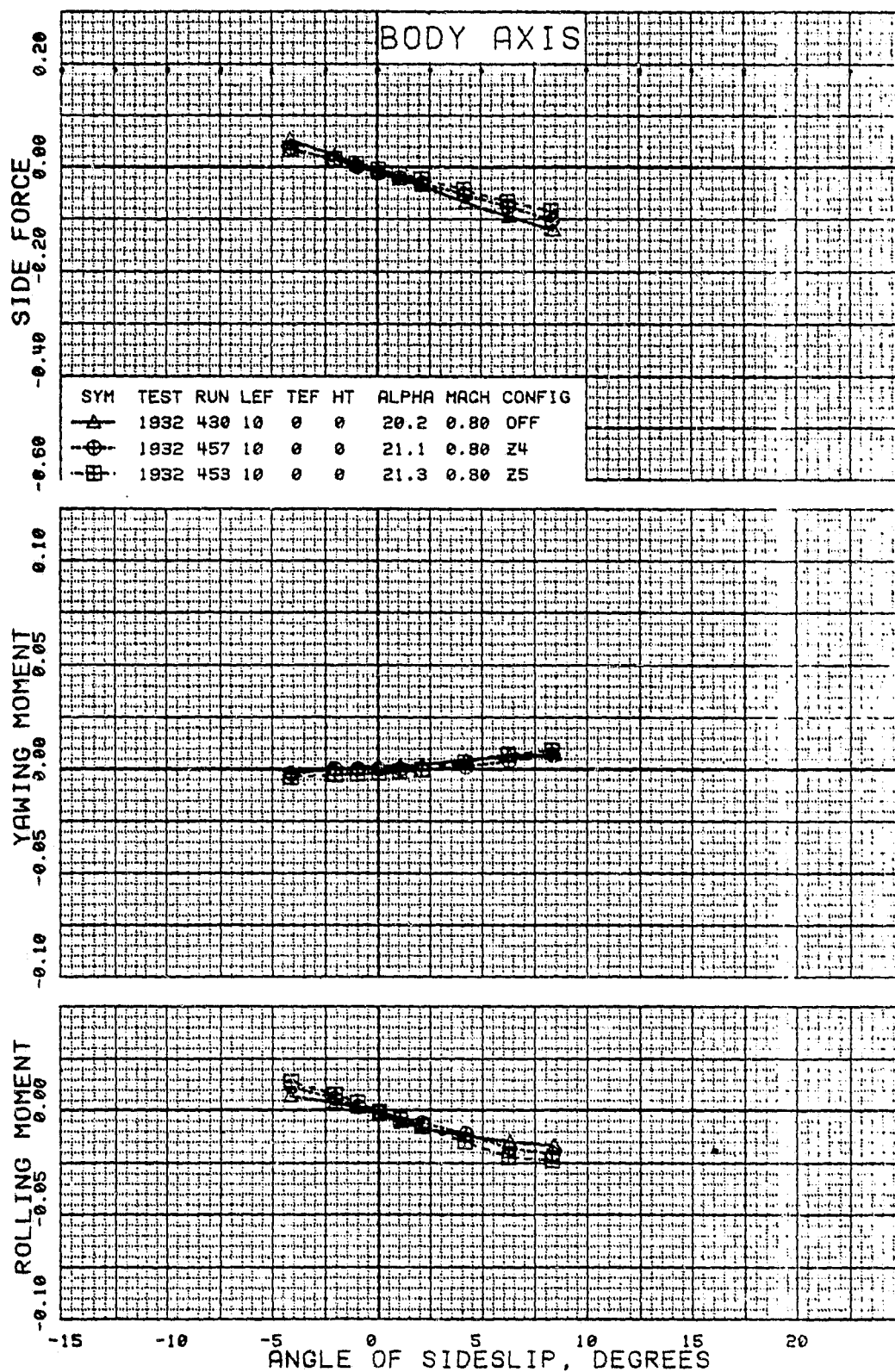


Figure 4-19 (c) Force and Moments, $\alpha = 20^\circ$

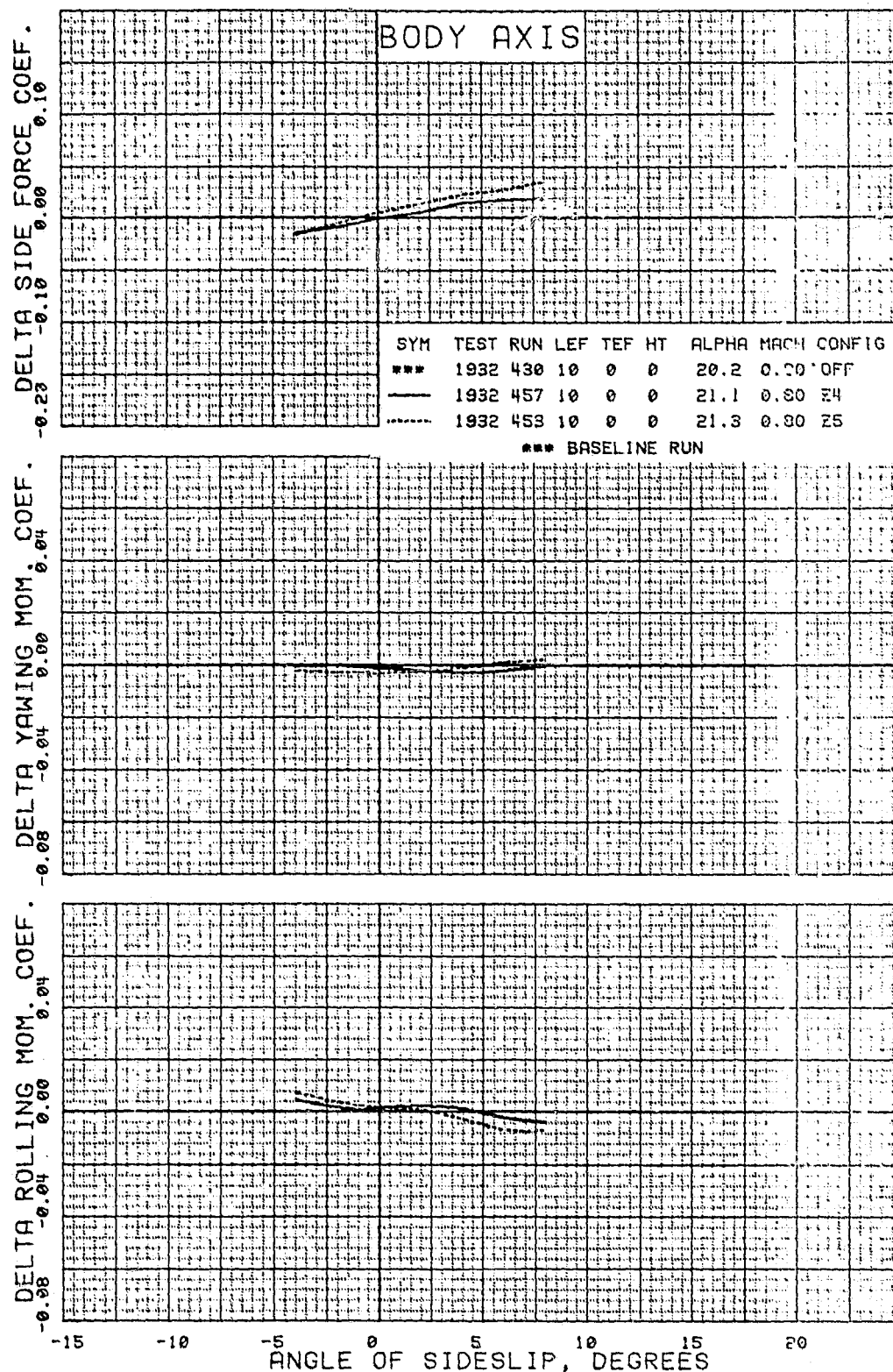


Figure 4-19 (d) Increments, $\alpha = 20^\circ$

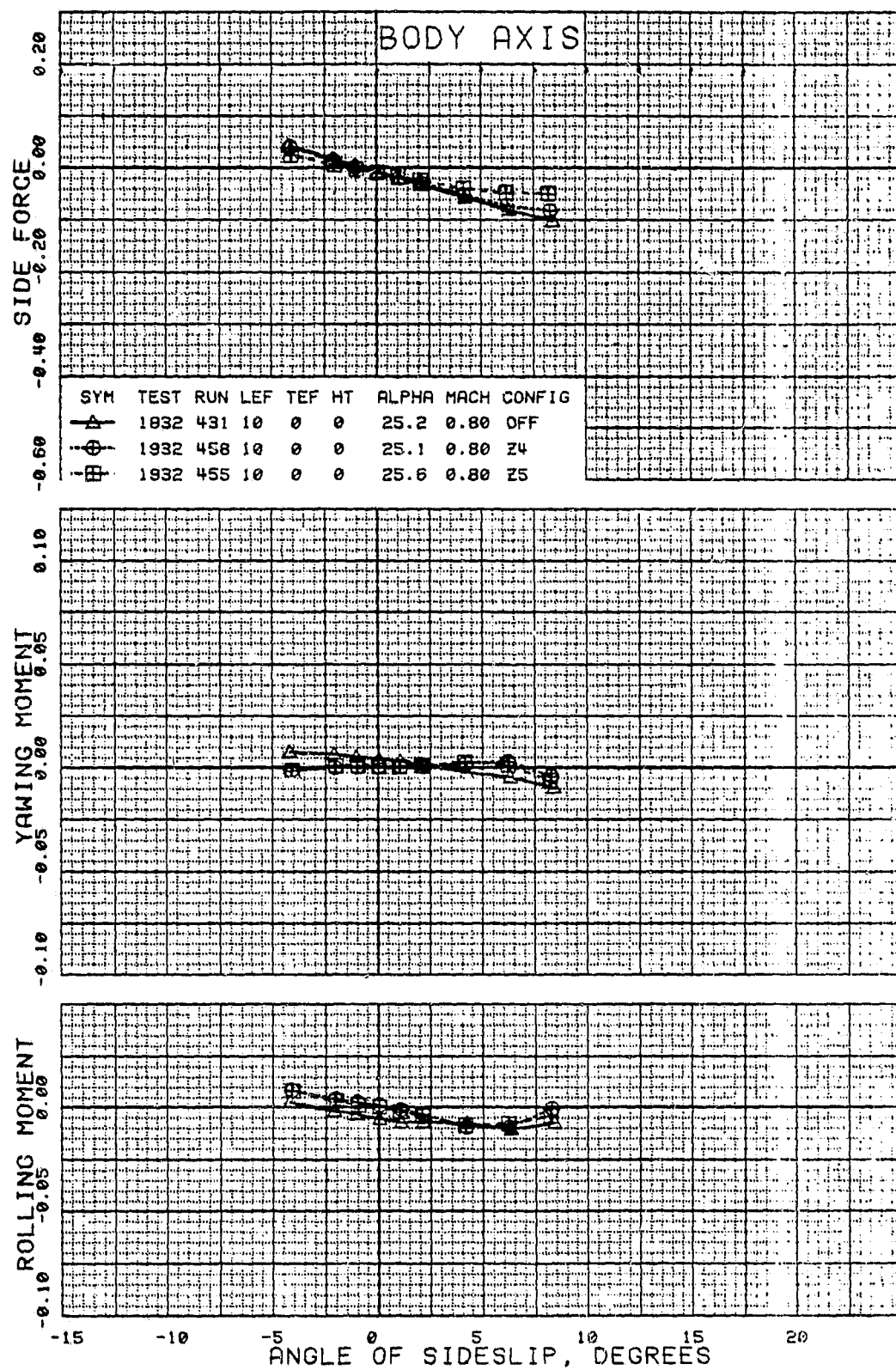


Figure 4-19 (e) Force and Moments, $\alpha = 25^\circ$

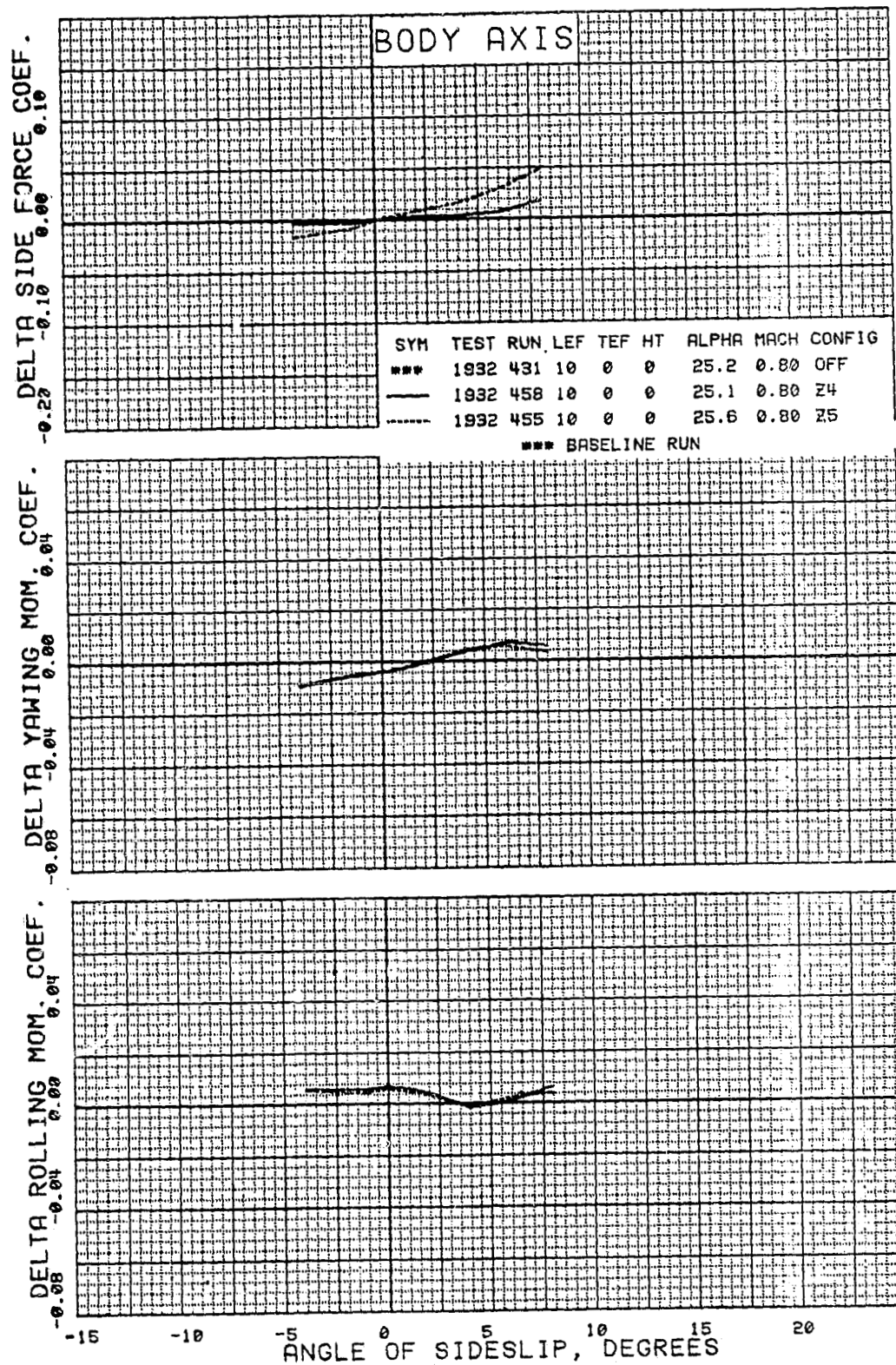


Figure 4-19 (f) Increments, $\alpha = 25^\circ$

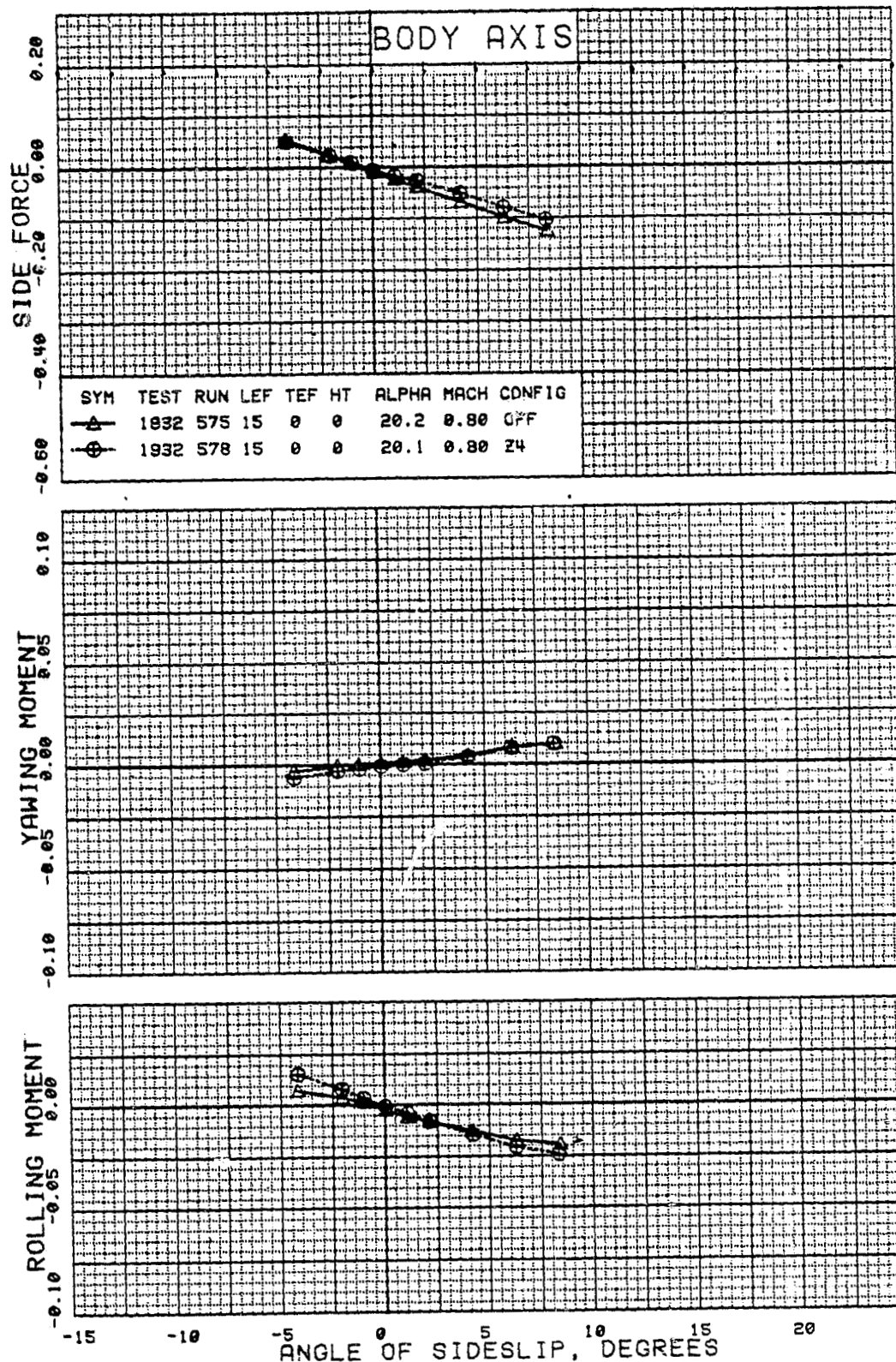


Figure 4-20 Effect of Forebody Strake Z4, Configuration 401F-5, LEF = 15°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

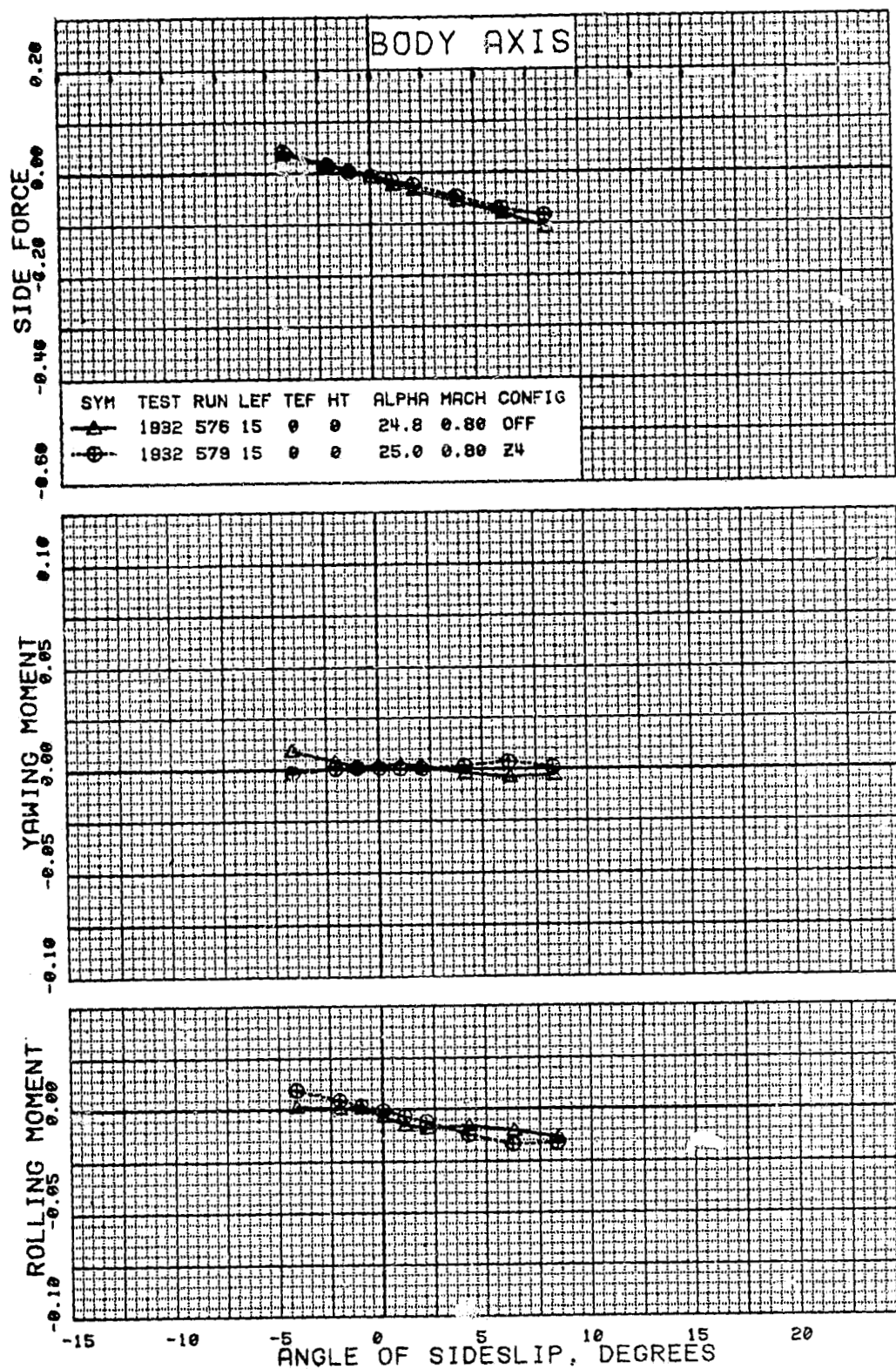


Figure 4-20 (b) Force and Moments, $\alpha = 25^\circ$

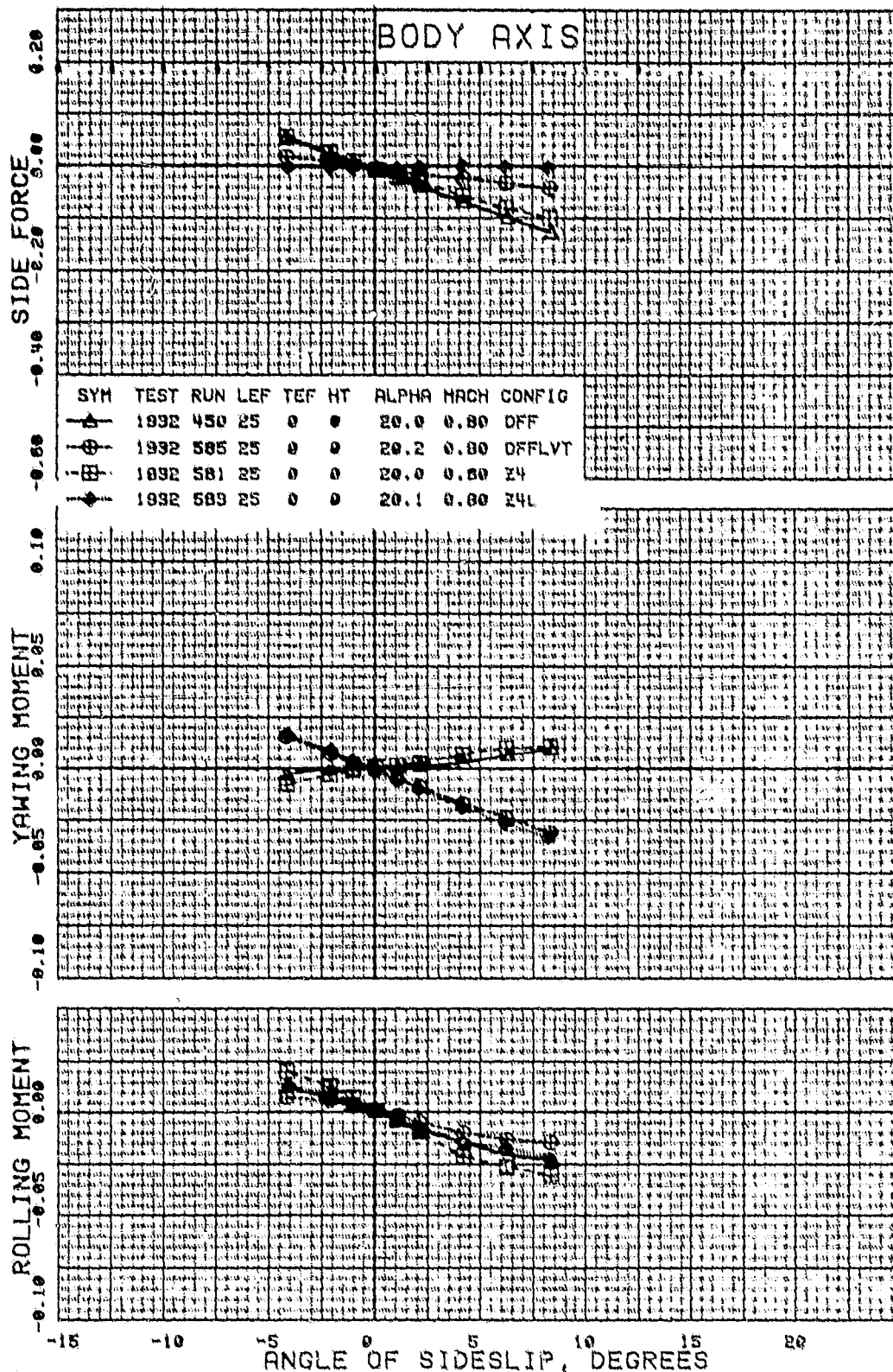


Figure 4-21 Effect of Forebody Strake Z4 on Vertical Tail Effectiveness, Configuration 401F-5, $M = 0.80$
(a) Force and Moments, $\alpha = 20^\circ$

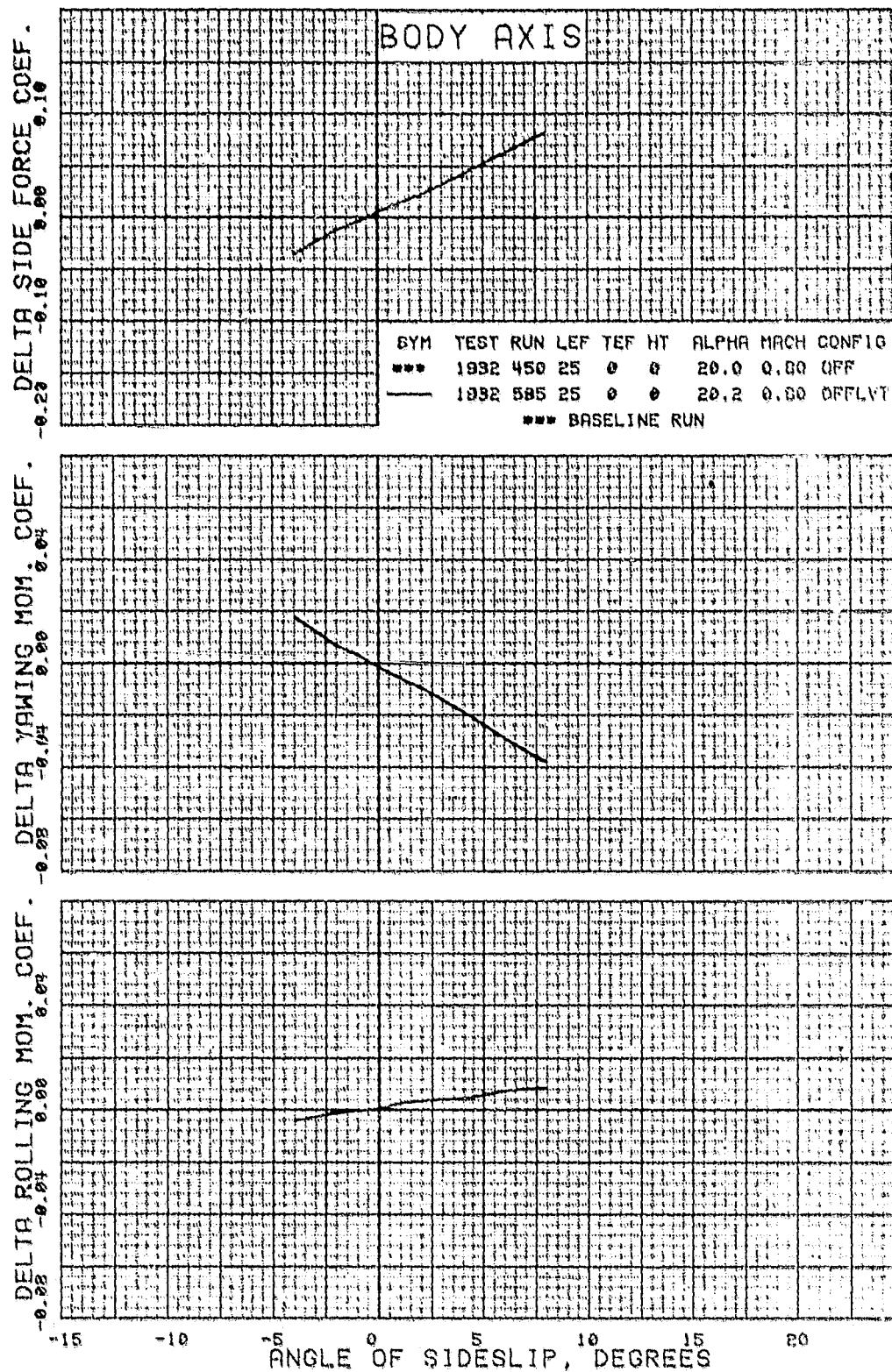


Figure 4-21 (b) Strake-off Increments, $\alpha = 20^\circ$

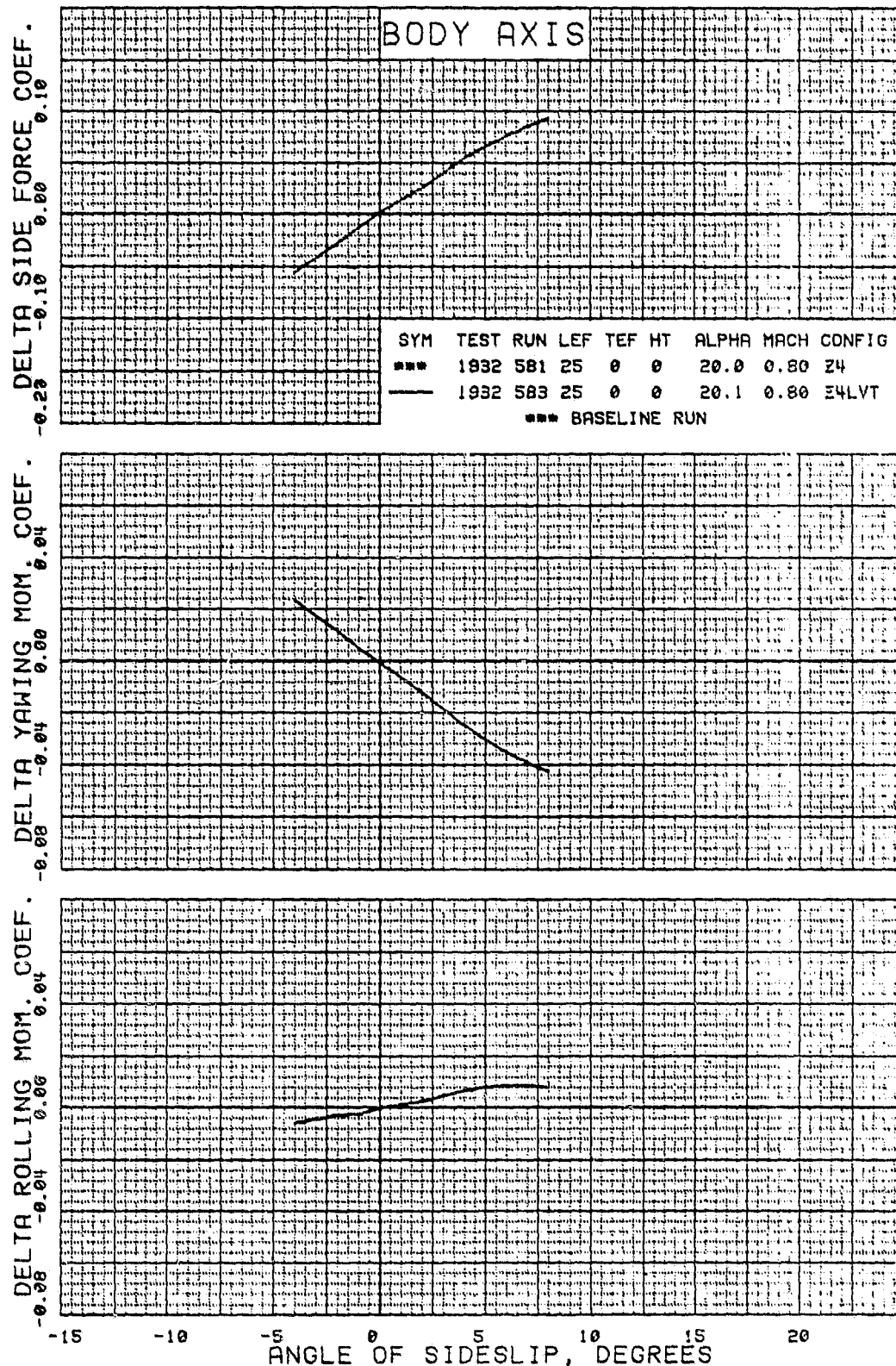


Figure 4-21 (c) Strake-on Increments, $\alpha = 20^\circ$

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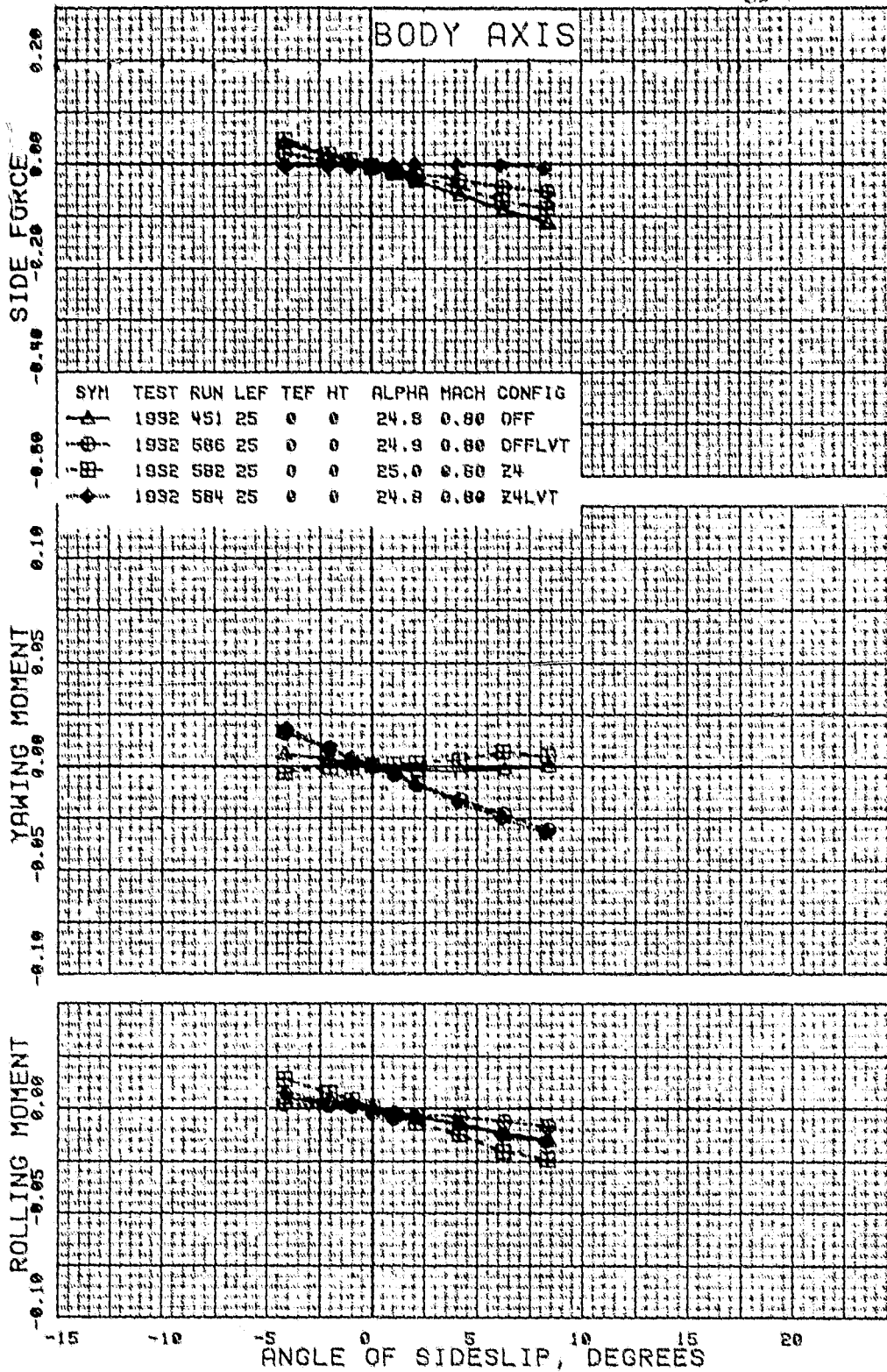


Figure 4-21 (d) Force and Moments, $\alpha = 25^\circ$

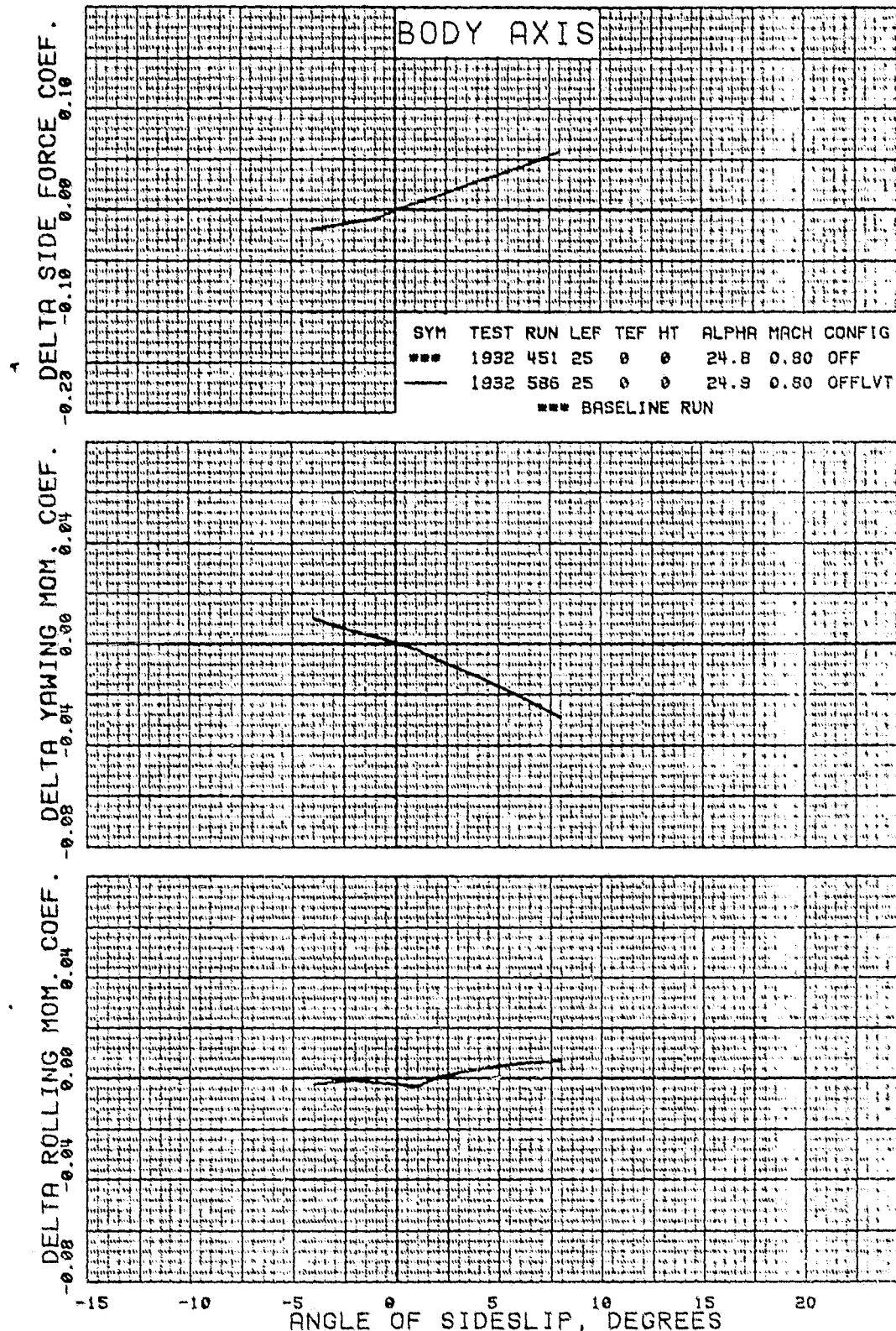


Figure 4-21 (e) Strake-off Increments, $\alpha = 25^\circ$

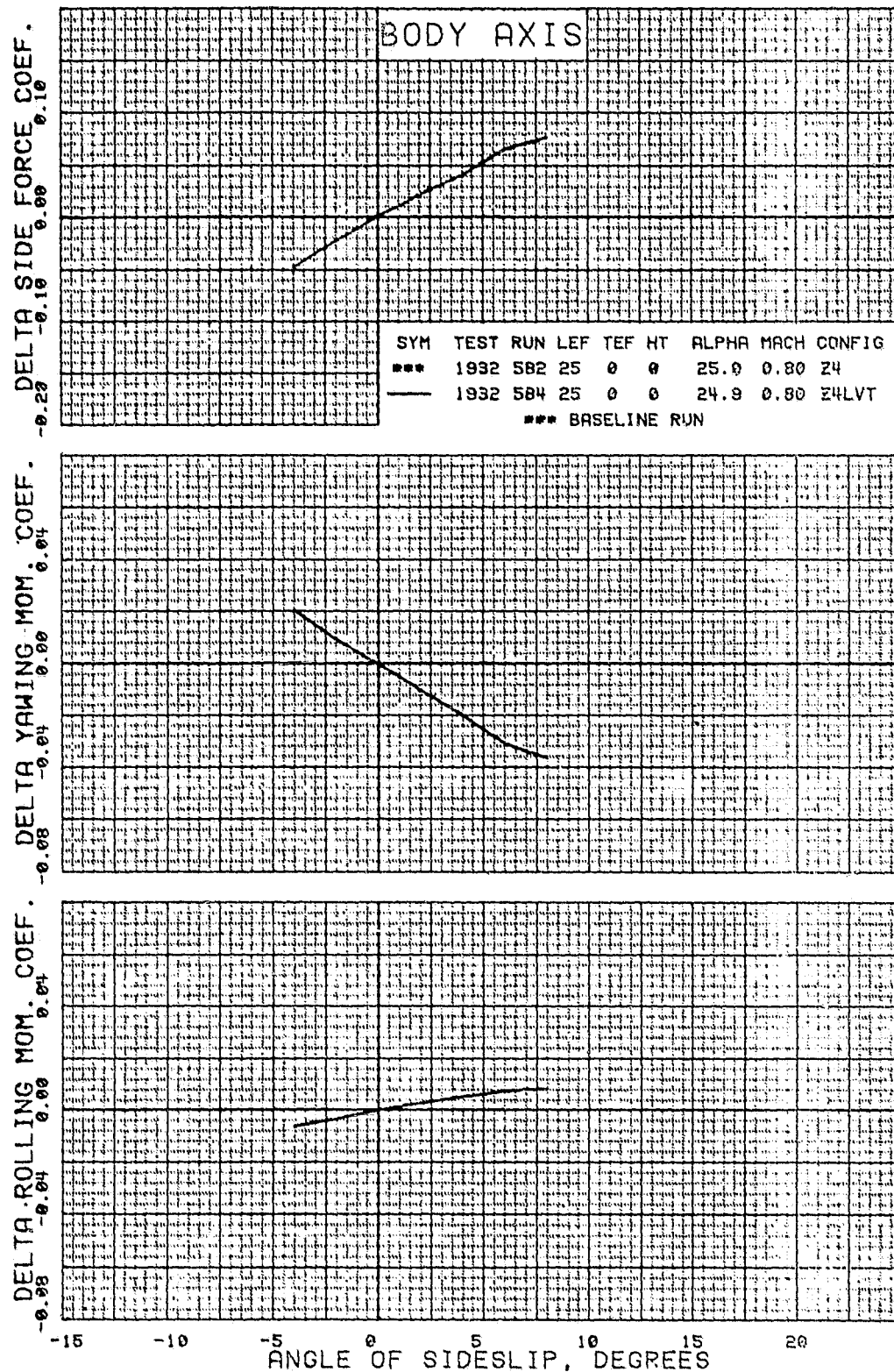


Figure 4-21 (f) Strake-on Increments, $\alpha = 25^\circ$

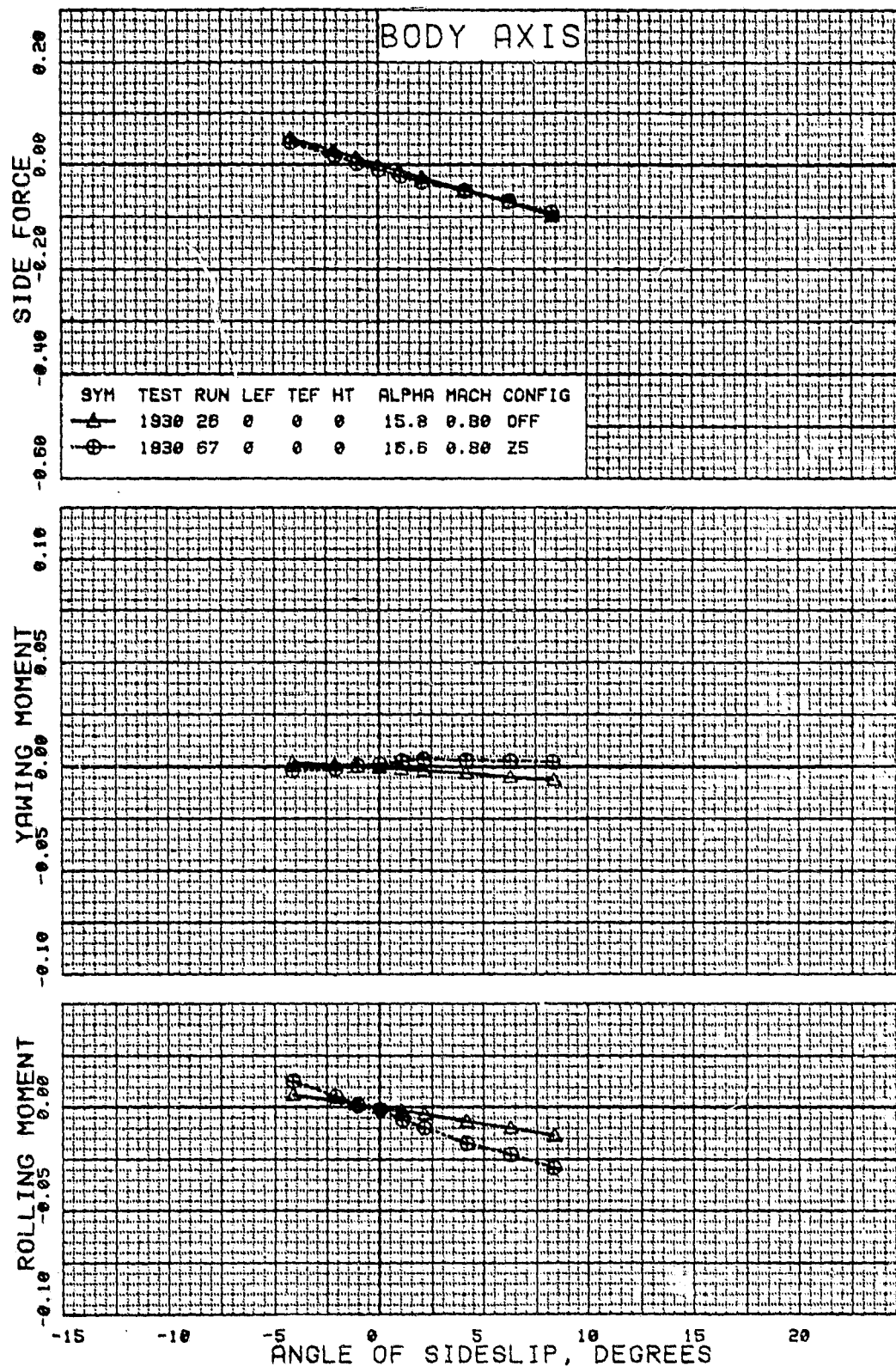


Figure 4-22 Effect of Forebody Strake Z5, Configuration 401F-4, $M = 0.80$
 (a) Force and Moments, $\alpha = 16^\circ$

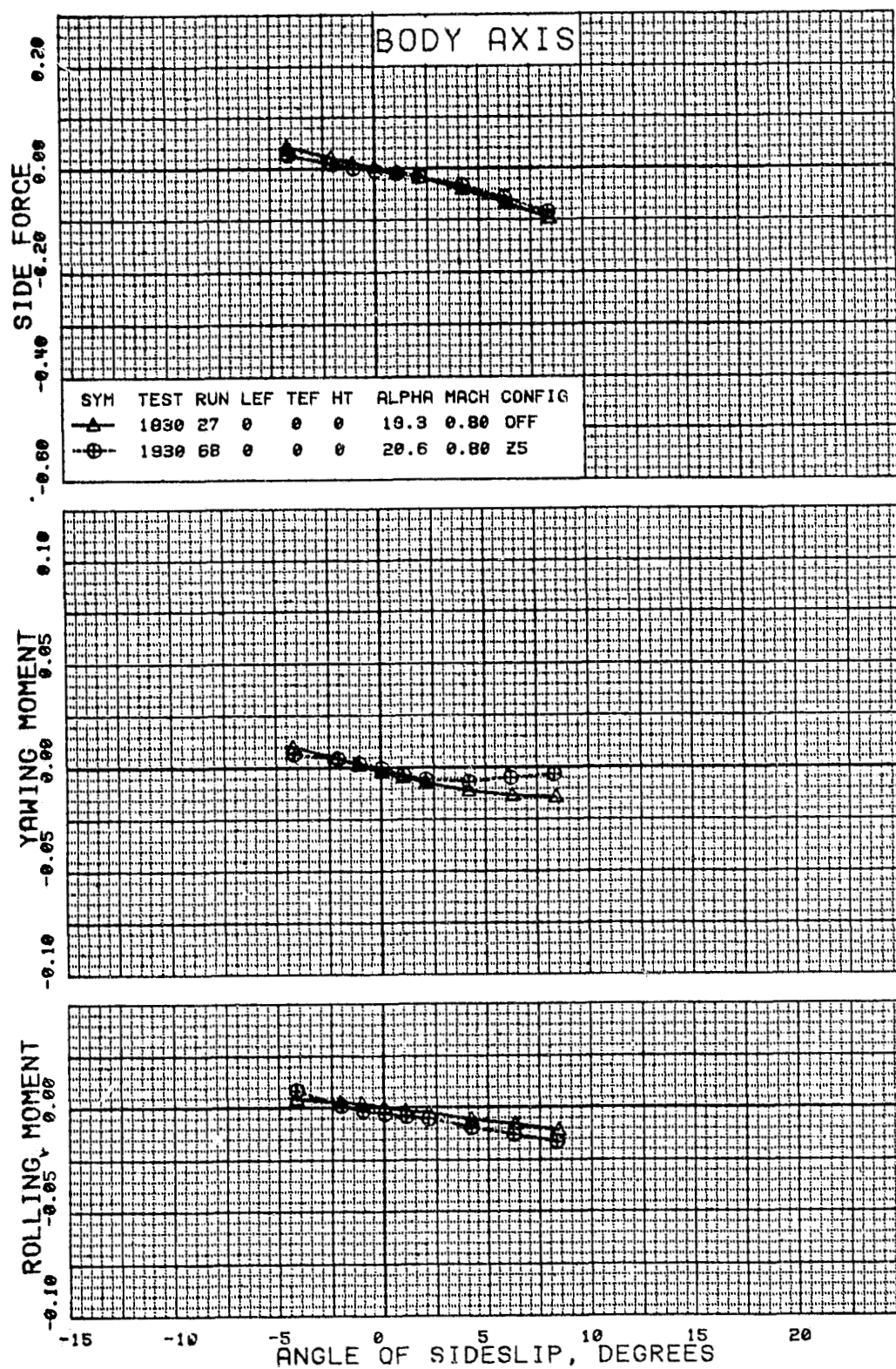


Figure 4-22 (b) Force and Moments, $\alpha = 20^\circ$

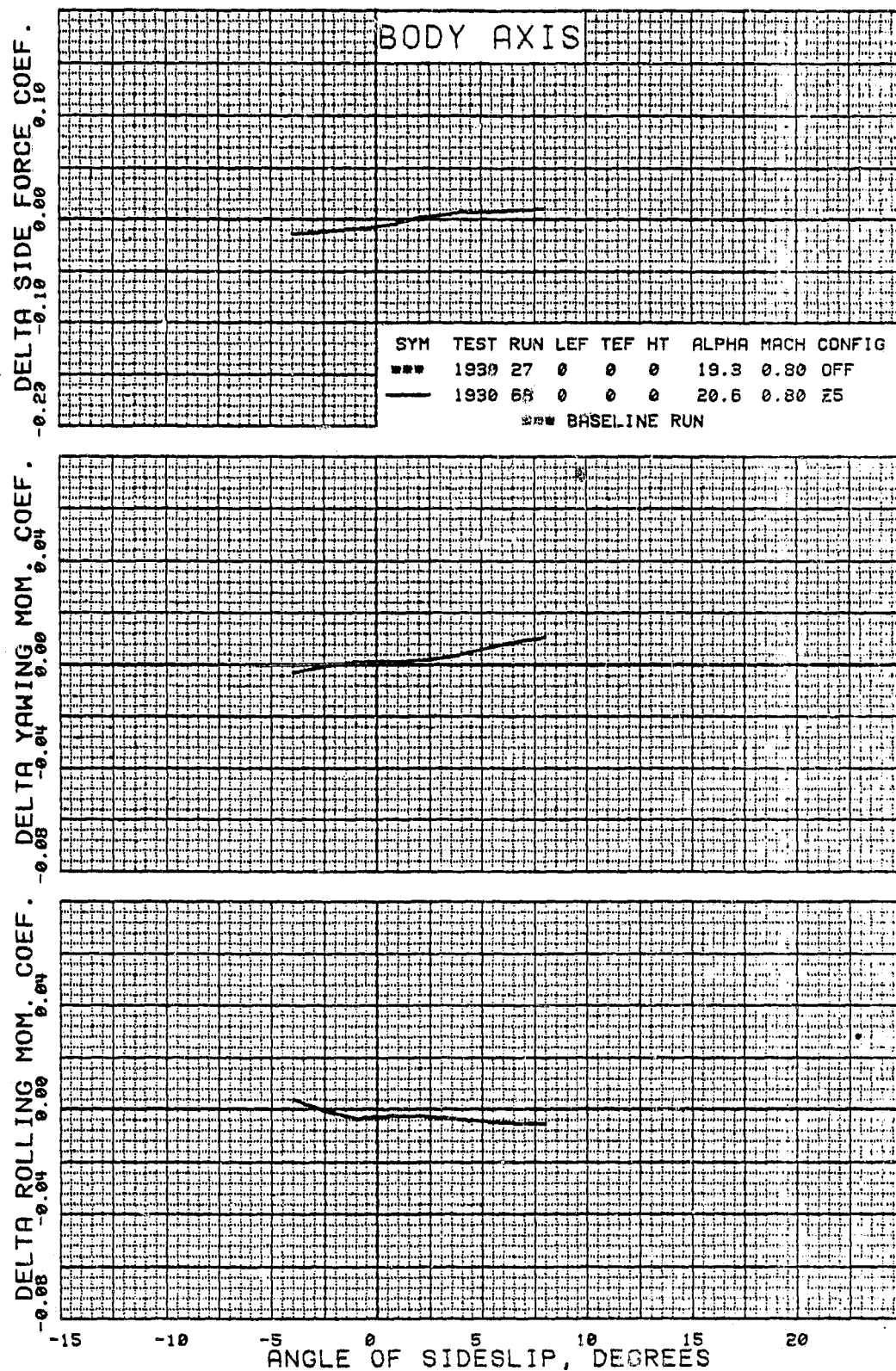


Figure 4-22 (c) Increments, $\alpha = 20^\circ$

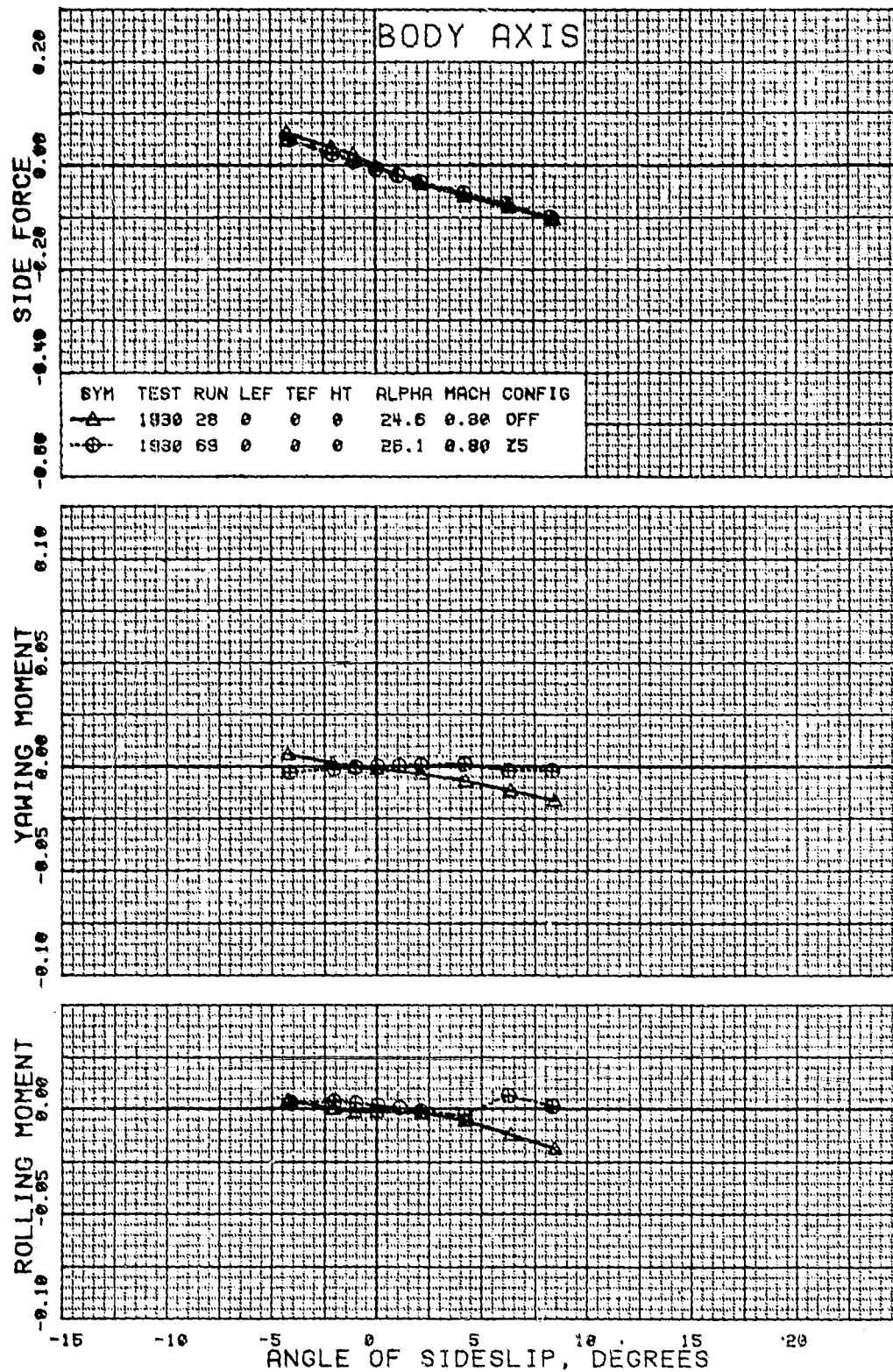


Figure 4-22 (d) Force and Moments, $\alpha = 25^\circ$

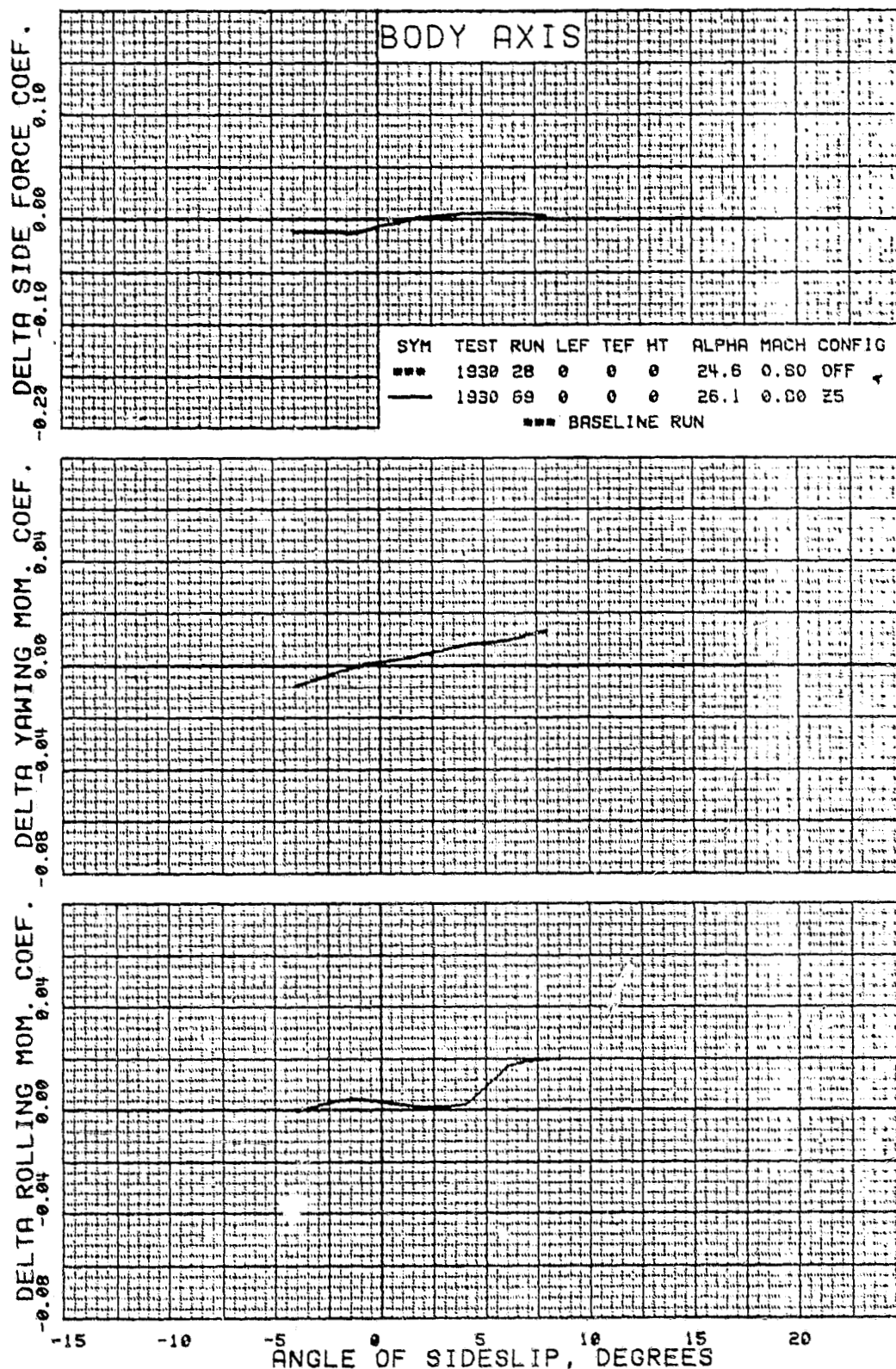


Figure 4-22 (e) Increments, $\alpha = 25^\circ$

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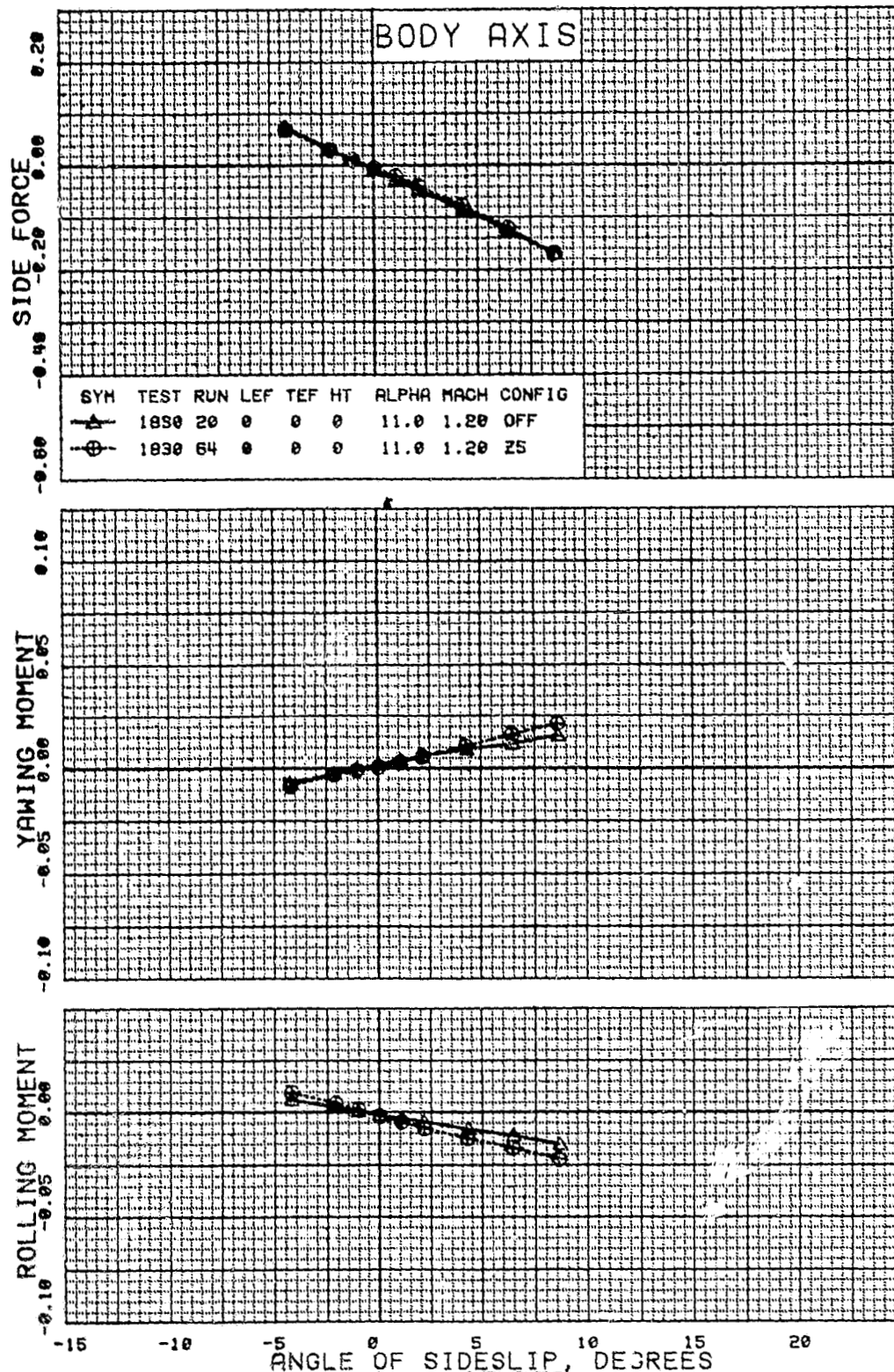
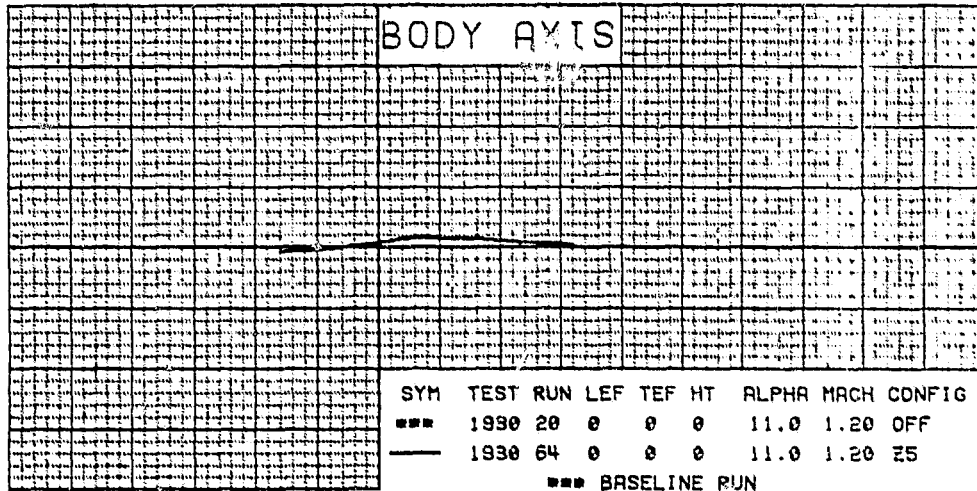
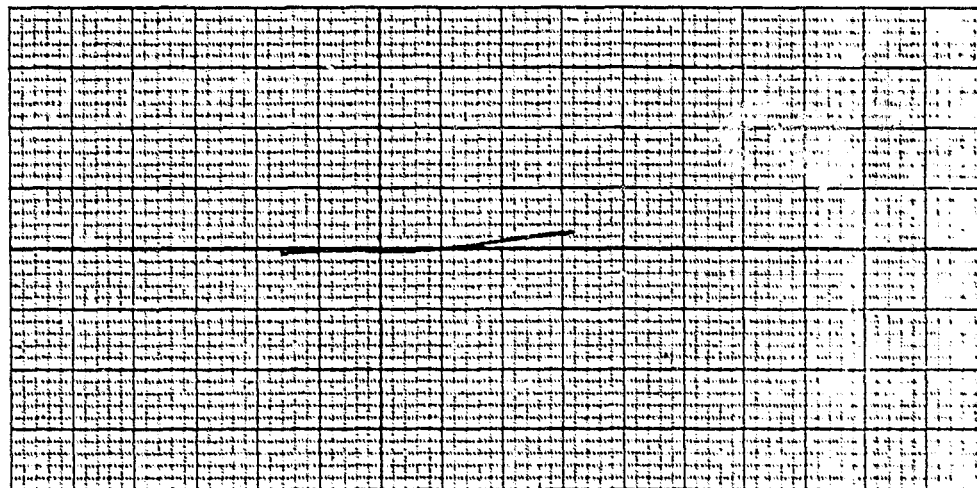


Figure 4-23 Effect of Forebody Strake Z5, Configuration 401F-4, $M = 1.20$
(a) Force and Moments, $\alpha = 11^\circ$

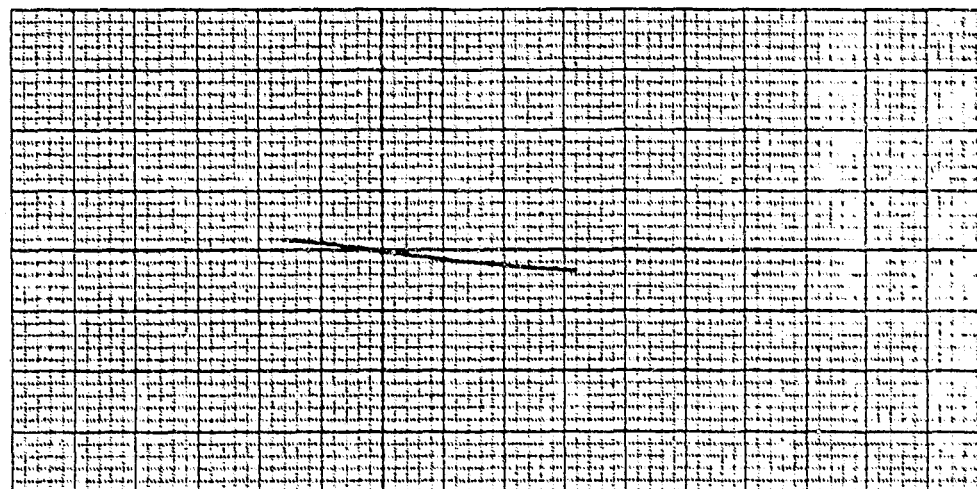
DELTA SIDE FORCE COEF.
-0.20 0.00 0.10 0.19



DELTA YAWING MOM. COEF.
-0.08 0.00 0.04 0.04



DELTA ROLLING MOM. COEF.
-0.08 0.00 0.04 0.04



ANGLE OF SIDESLIP, DEGREES

Figure 4-23 (b) Increments, $\alpha = 110$

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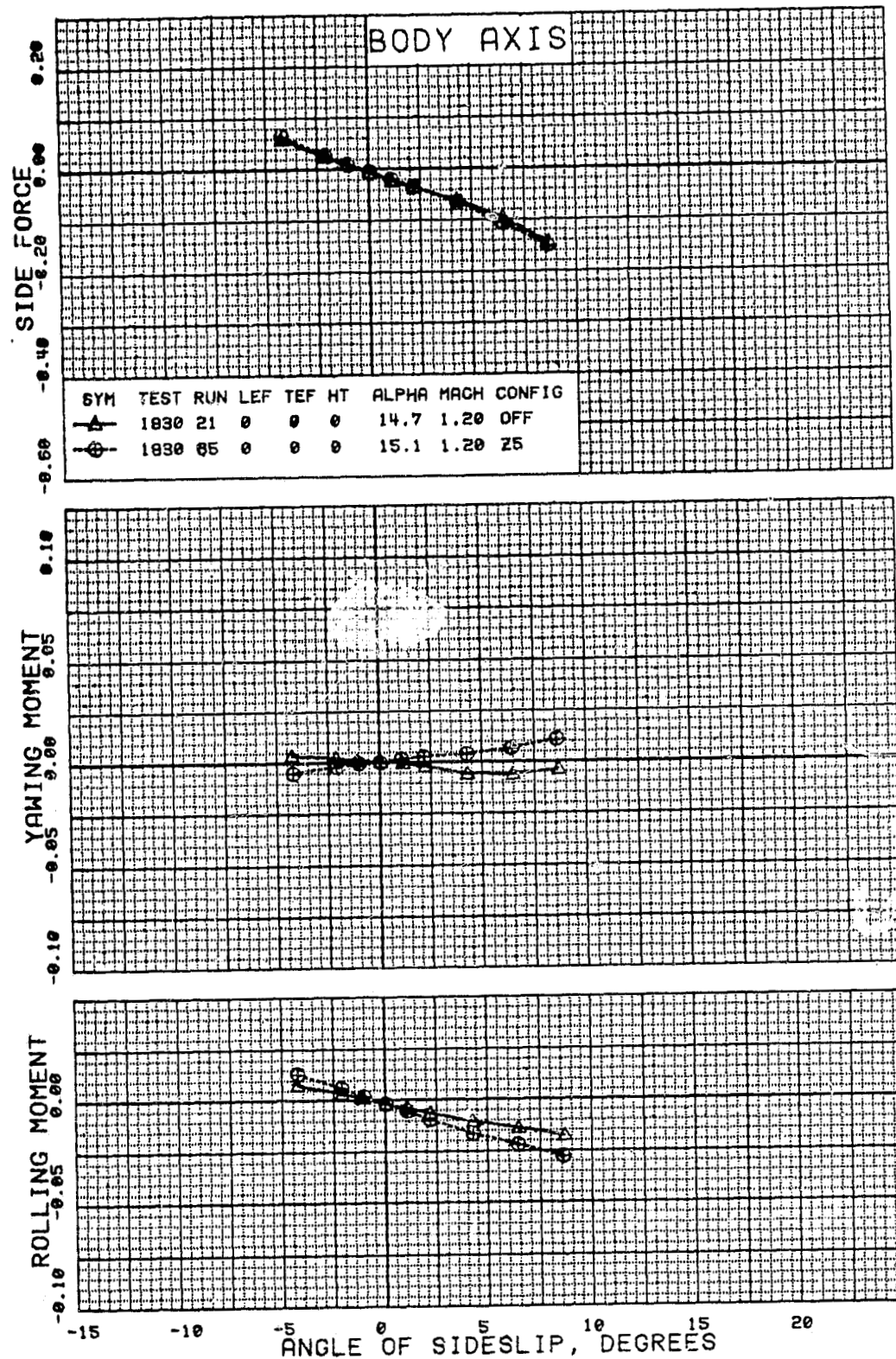
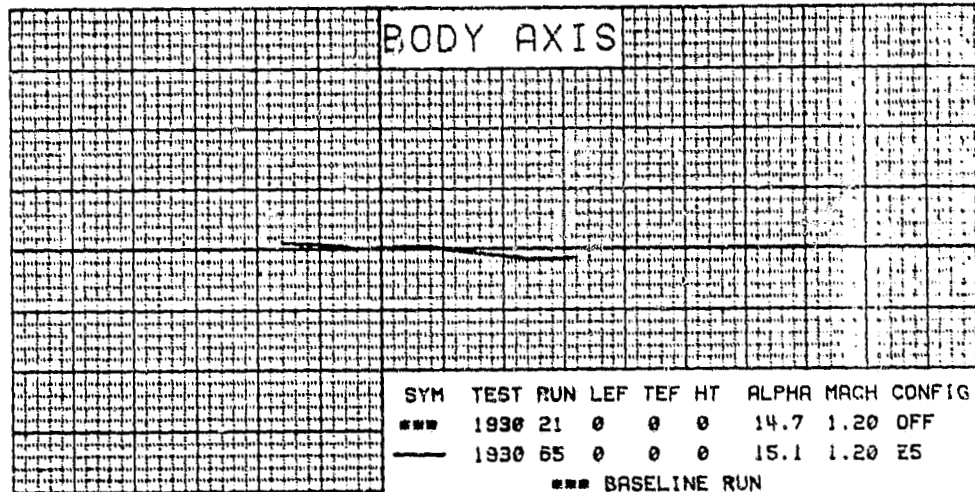
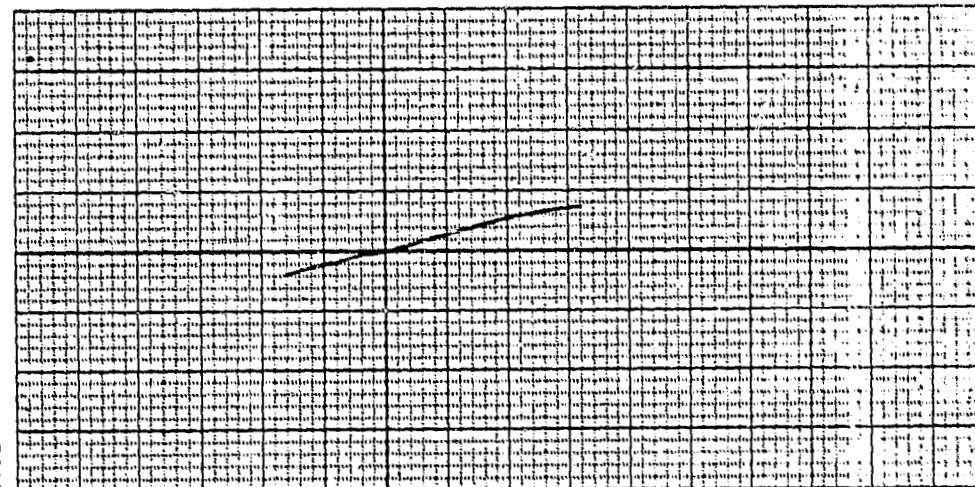


Figure 4-23 (c) Force and Moments, $\alpha = 15^\circ$

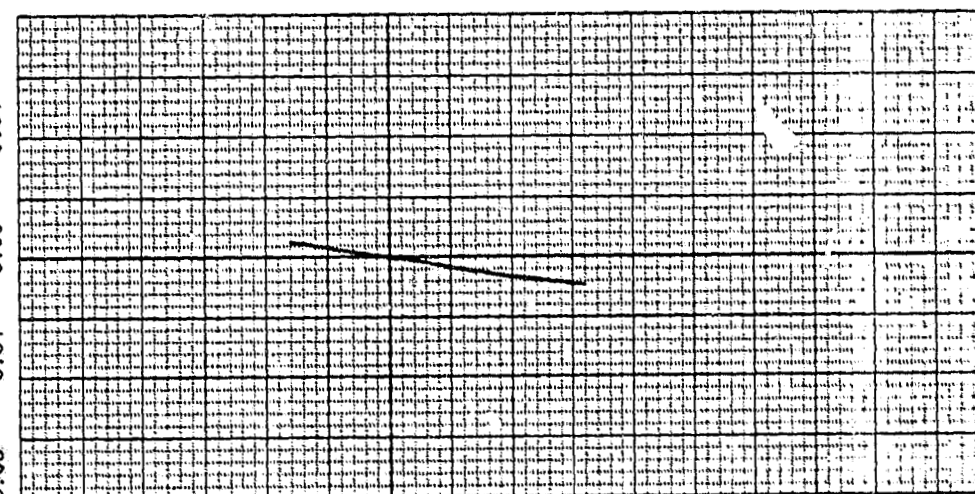
DELTA SIDE FORCE COEF.
-0.22 0.10 0.00 0.10 0.22



DELTA YAWING MOM. COEF.
-0.08 0.04 0.00 0.04 0.08



DELTA ROLLING MOM. COEF.
-0.08 0.04 0.00 0.04 0.08



ANGLE OF SIDESLIP, DEGREES

Figure 4-23 (d) Increments, $\alpha = 15^\circ$

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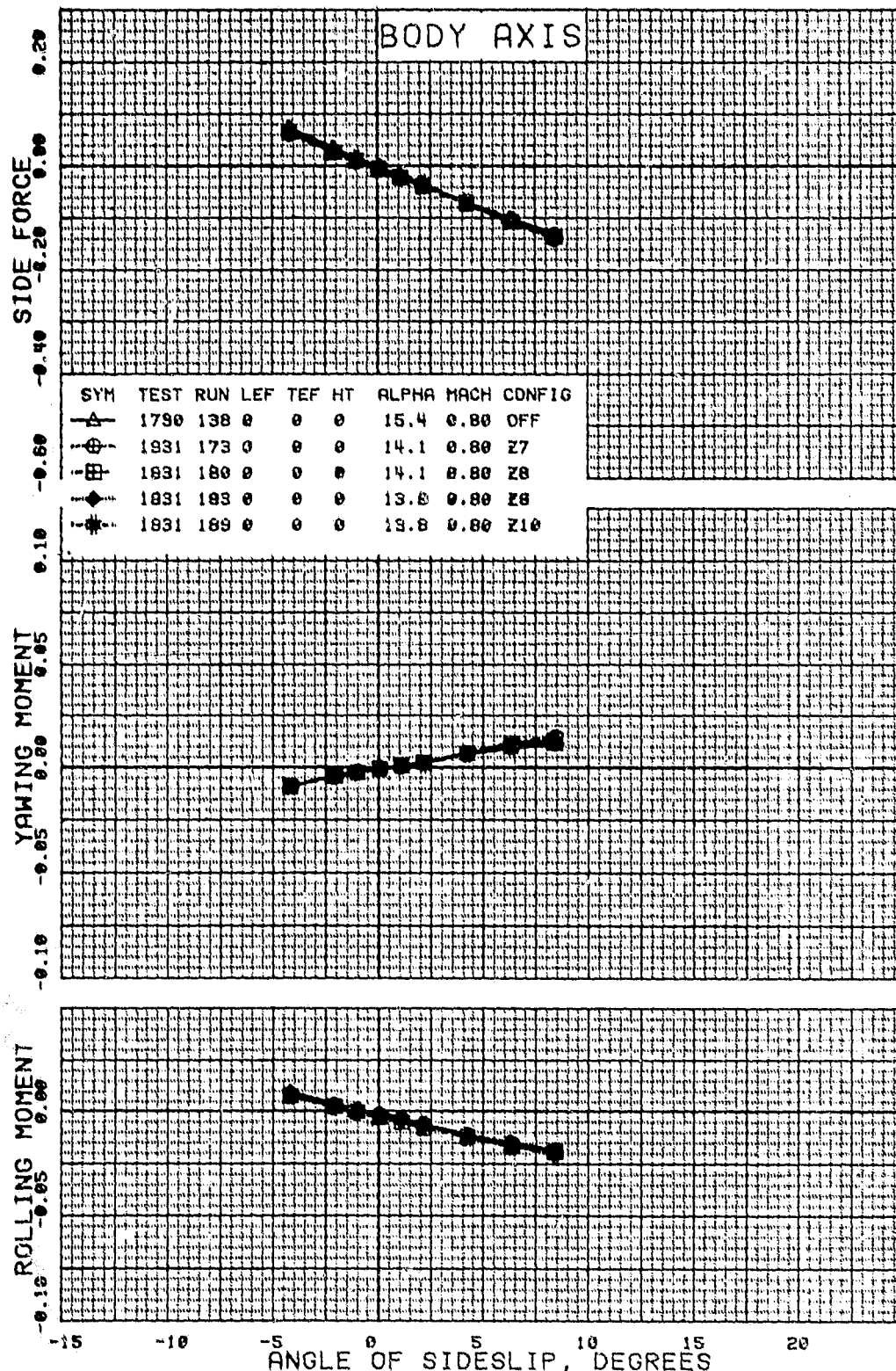


Figure 4-24 Effect of Delta Planform Forebody Strakes
(Z7-Z10), Configuration 785, LEF = 0,
M = 0.80
(a) Force and Moments, $\alpha = 14^\circ$

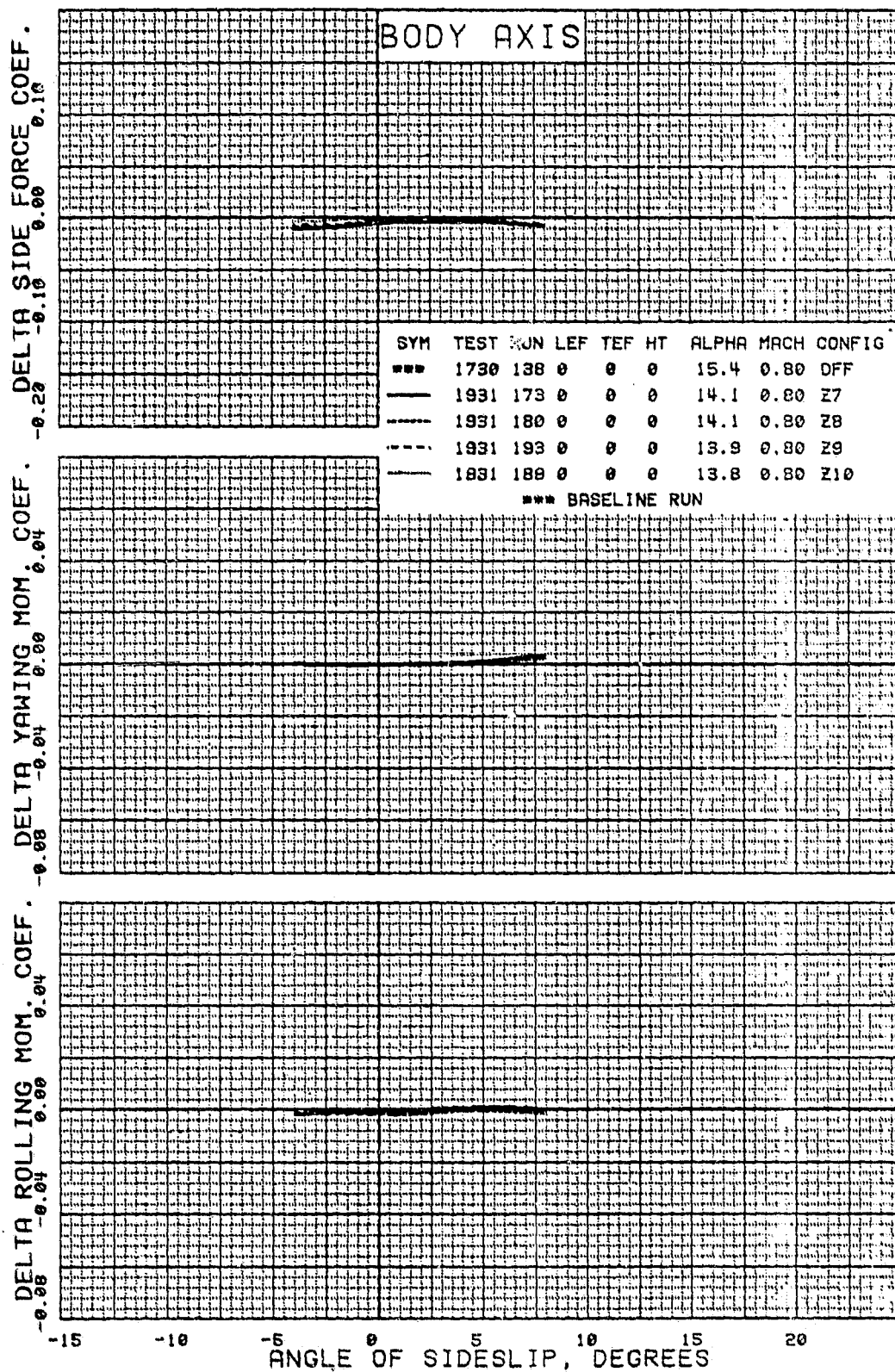


Figure 4-24 (b) Increments, $\alpha = 14^\circ$

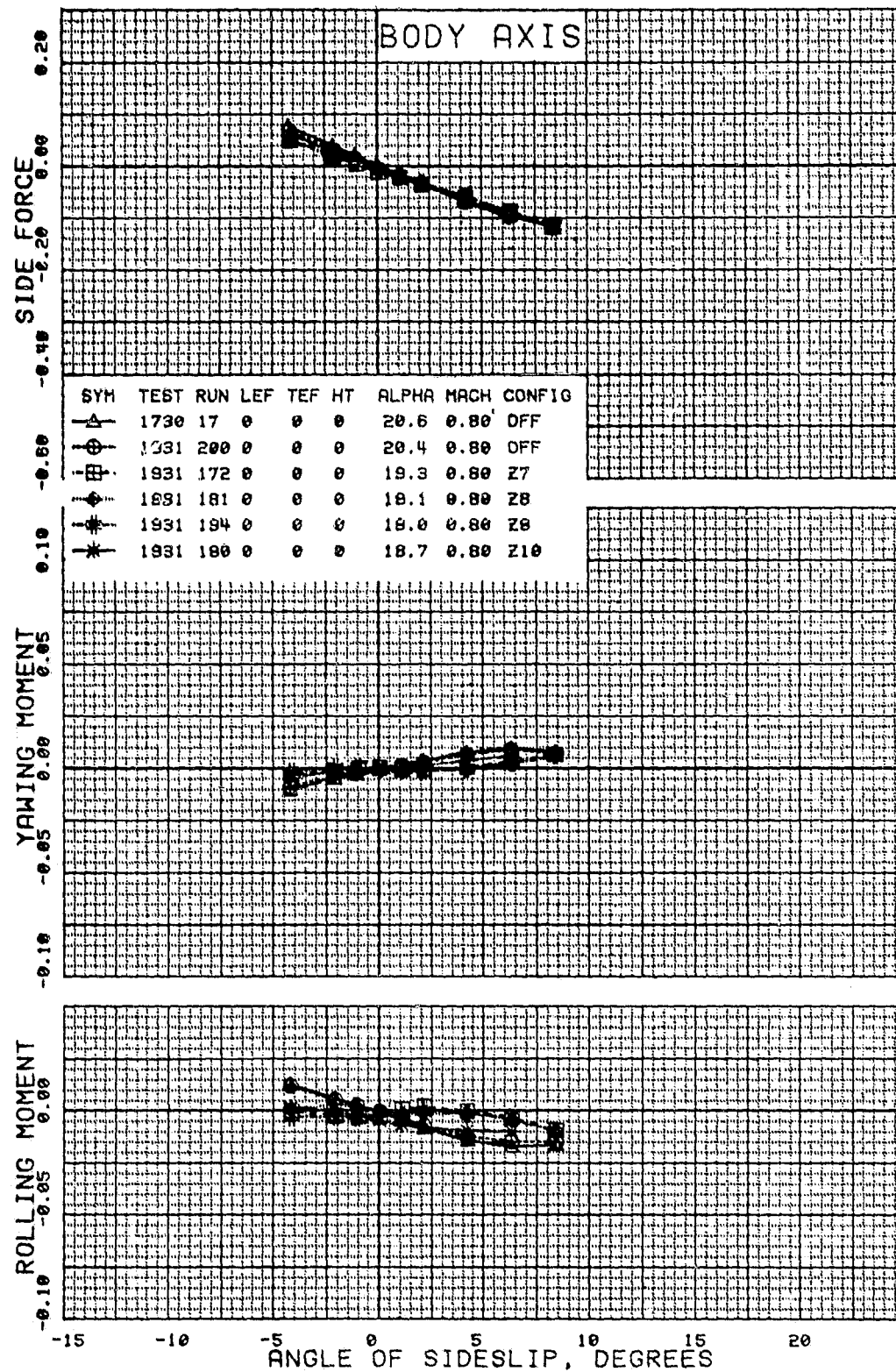


Figure 4-24 (c) Force and Moments, $\alpha = 20^\circ$

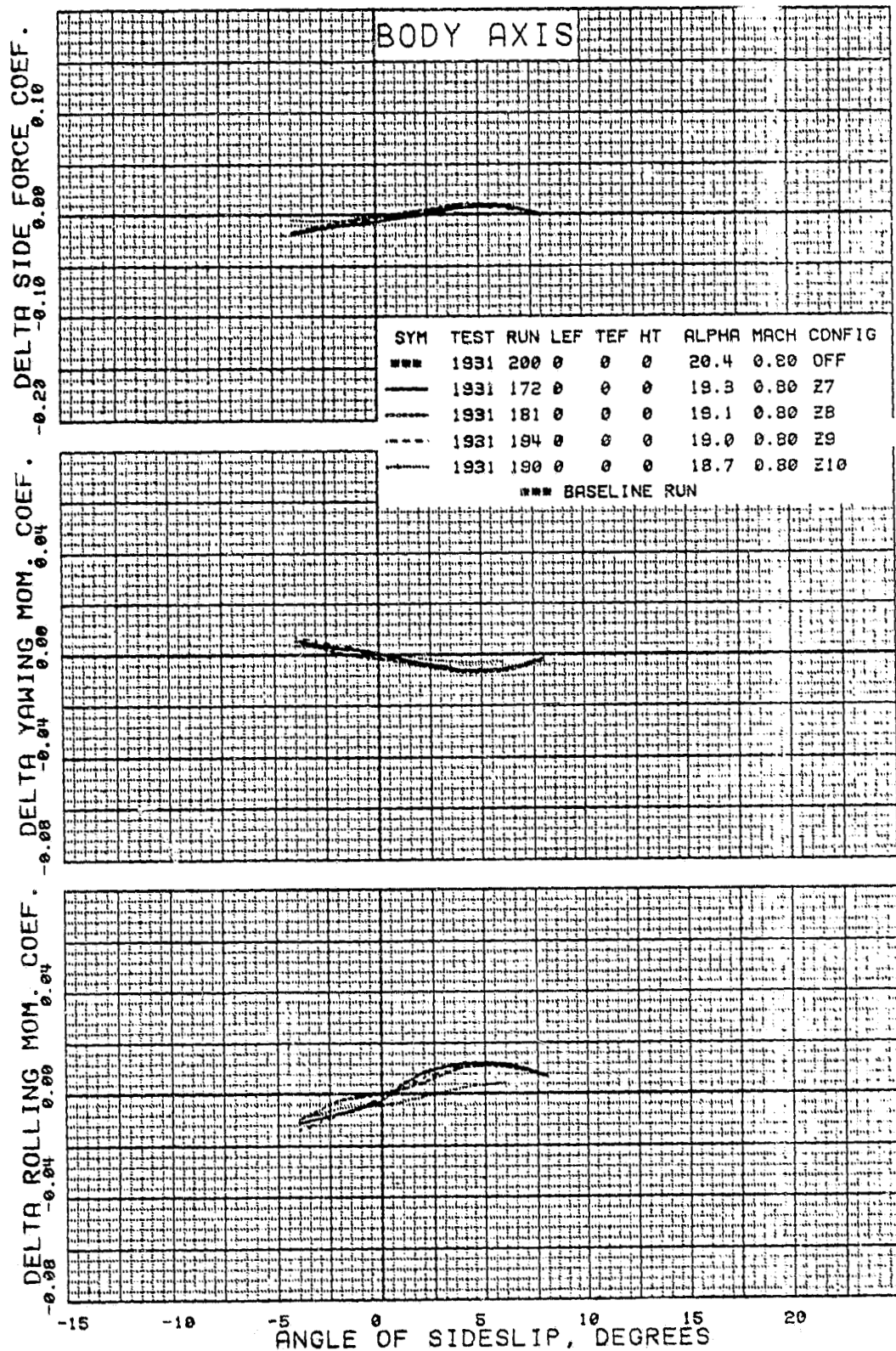


Figure 4-24 (d) Increments, $\alpha = 20^\circ$

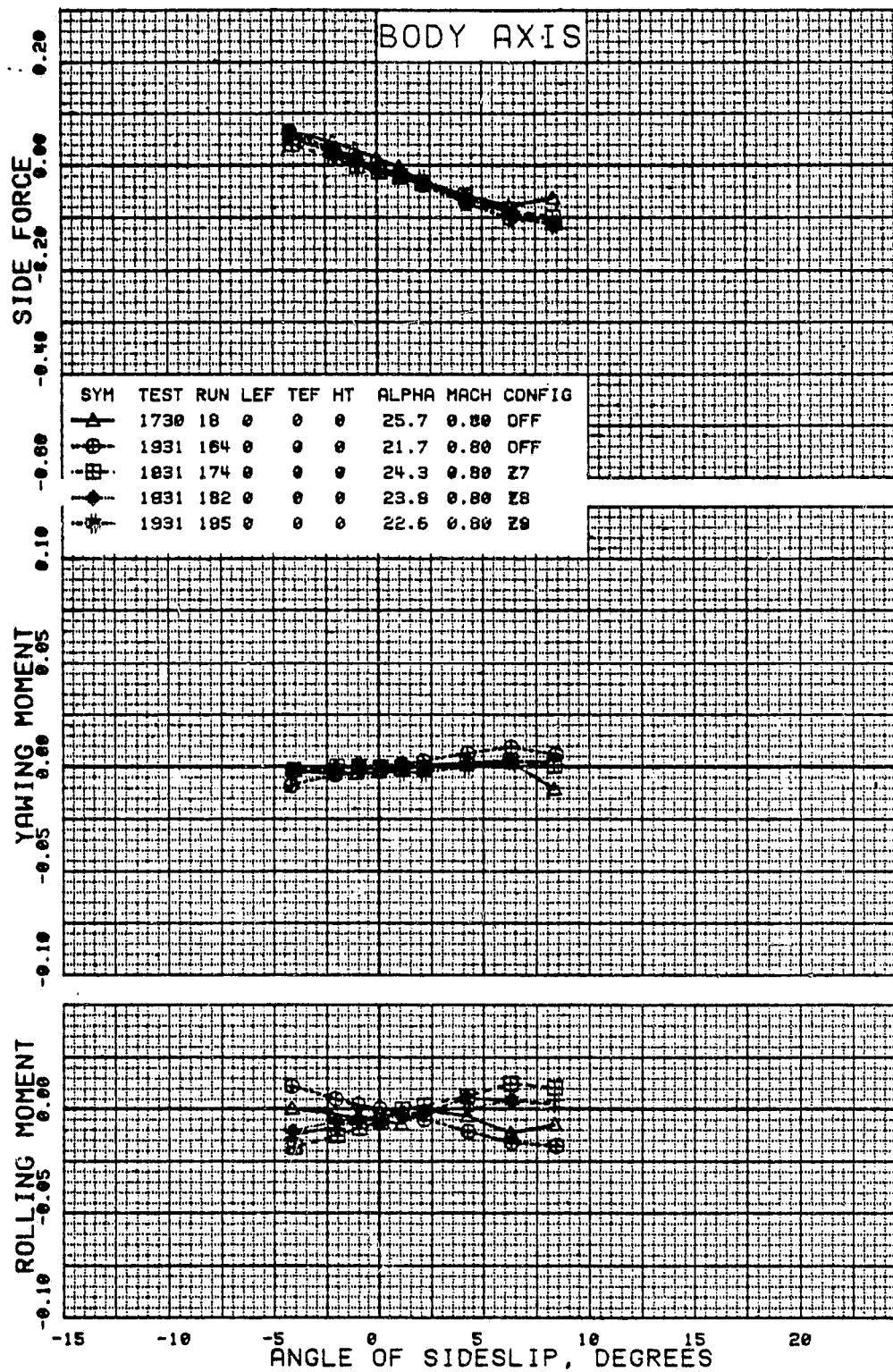


Figure 4-24 (e) Force and Moments, $\alpha = 24^\circ$

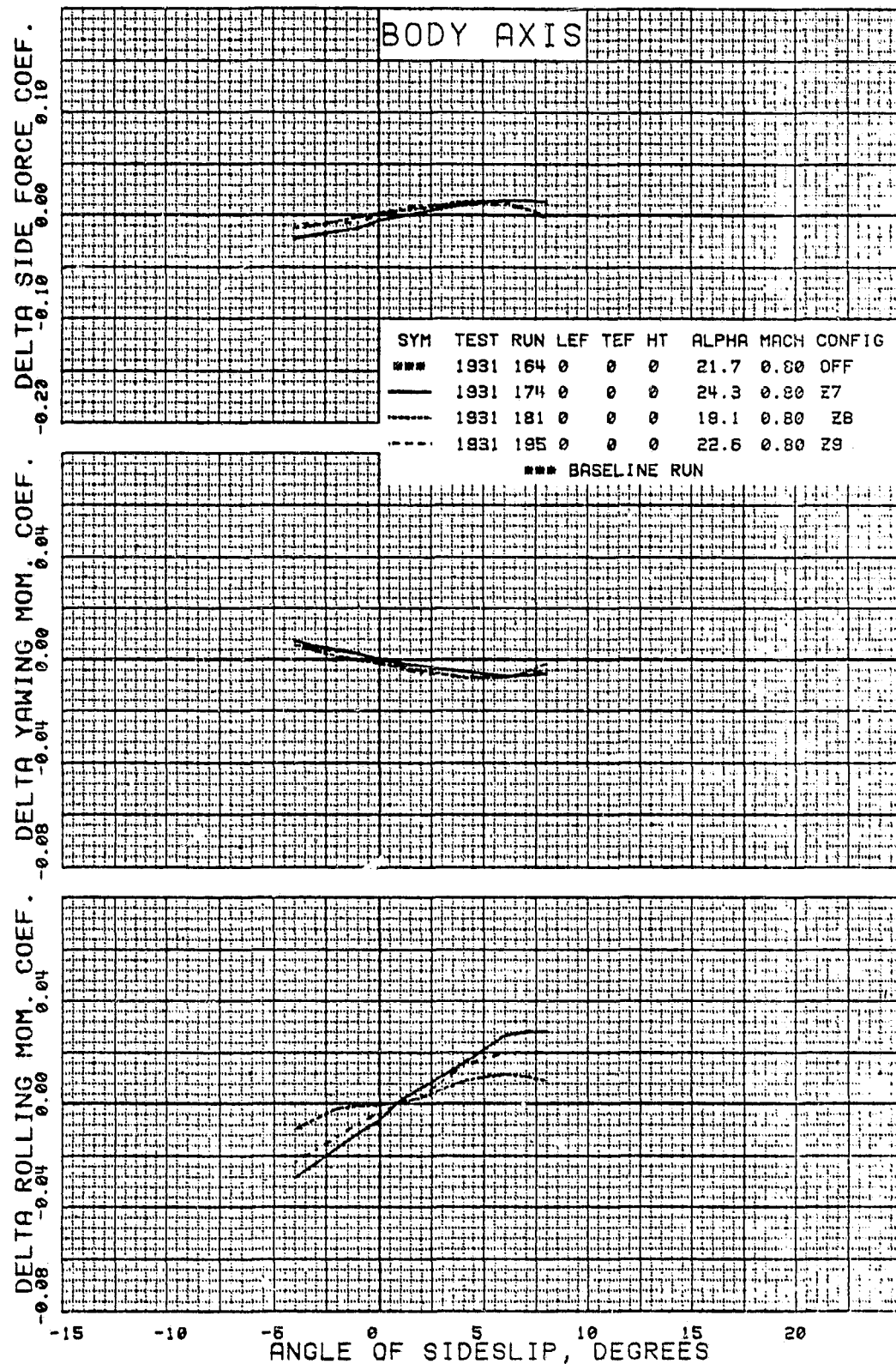


Figure 4-24 (f) Increments, $\alpha = 24^\circ$

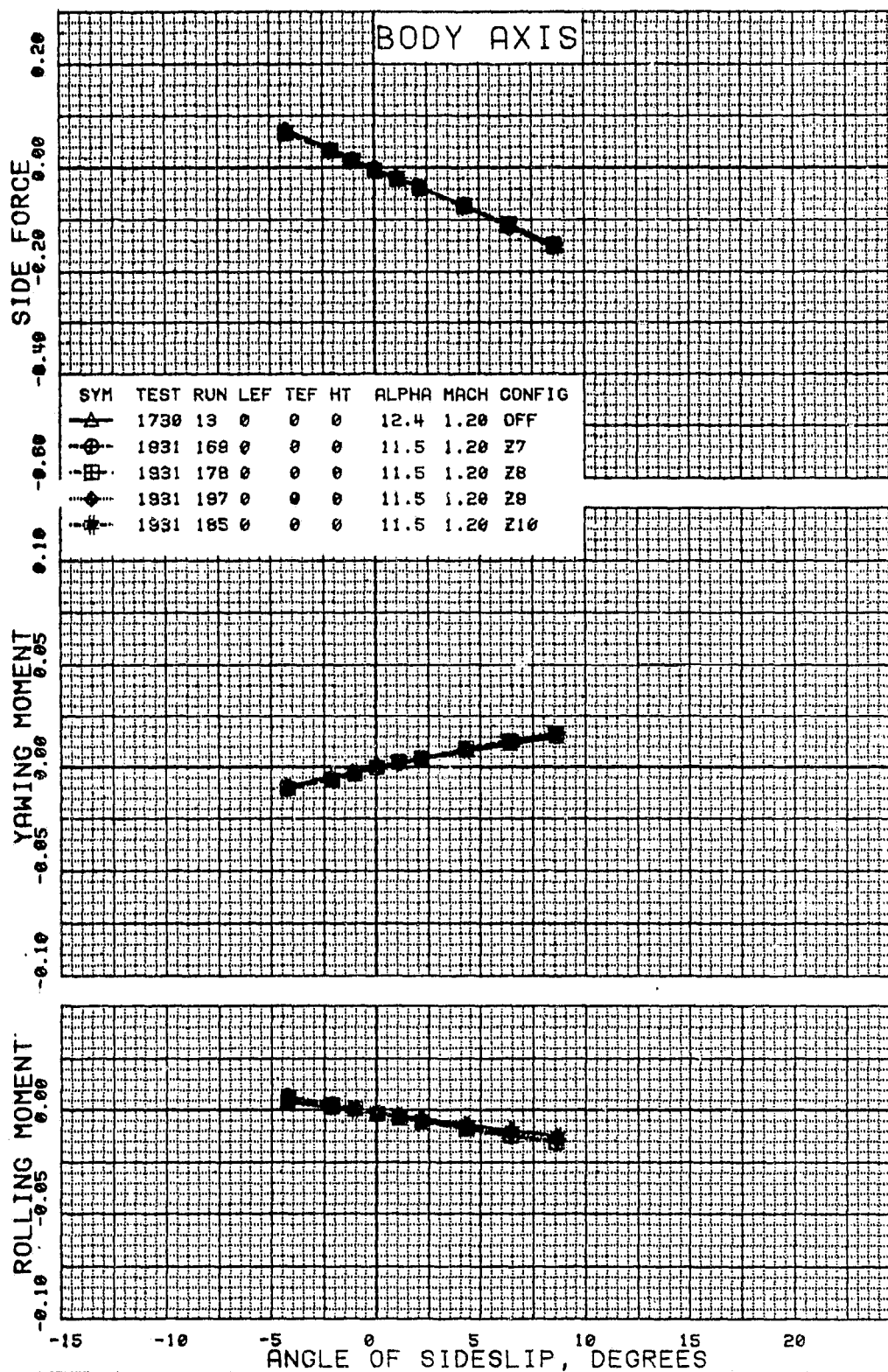


Figure 4-25 Effect of Delta Planform Forebody Strakes (Z7-Z10), Configuration 785, $M = 1.20$
 (a) Force and Moments, $\alpha = 12^\circ$

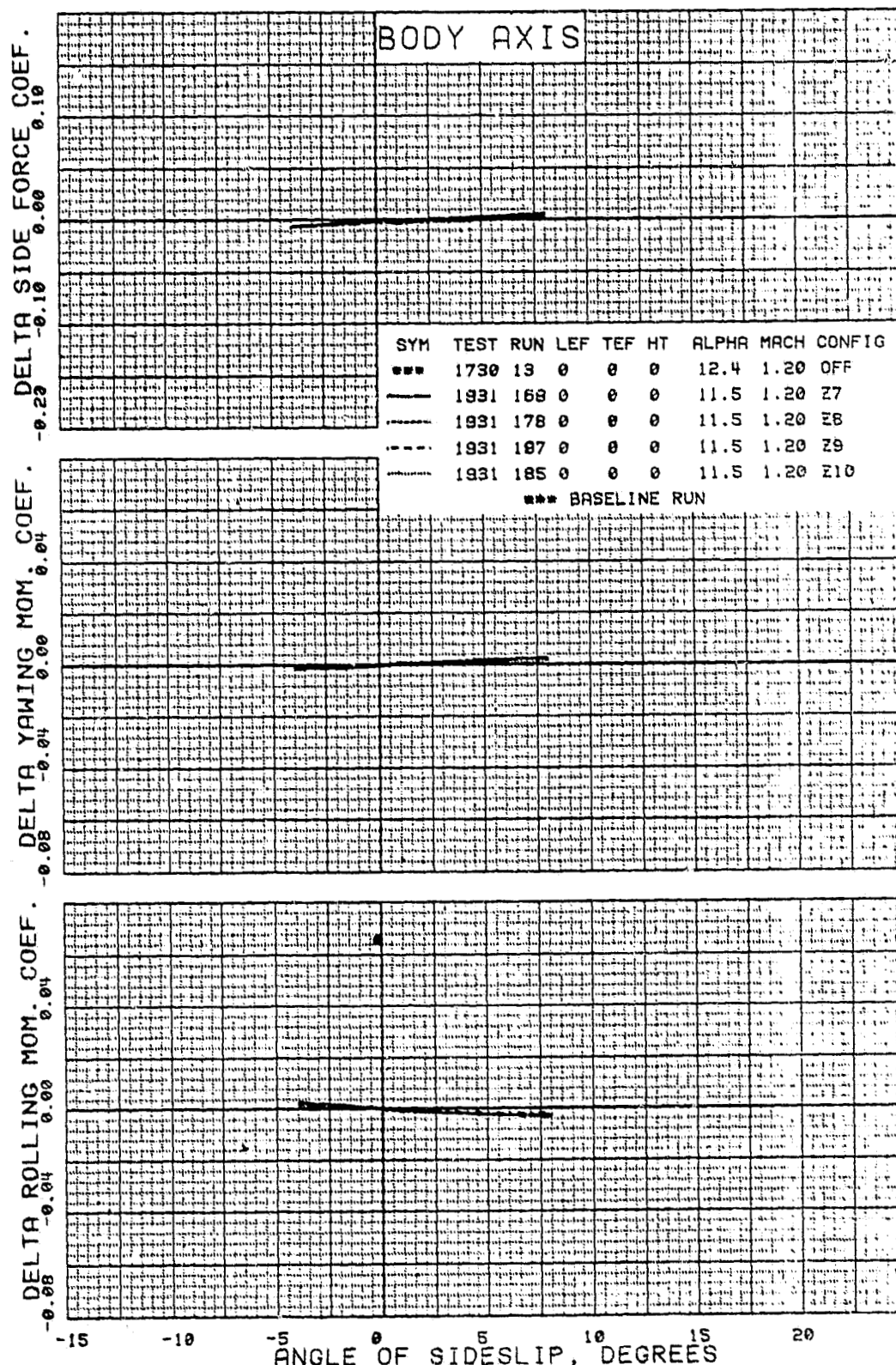


Figure 4-25 (b) Increments, $\alpha = 120^\circ$

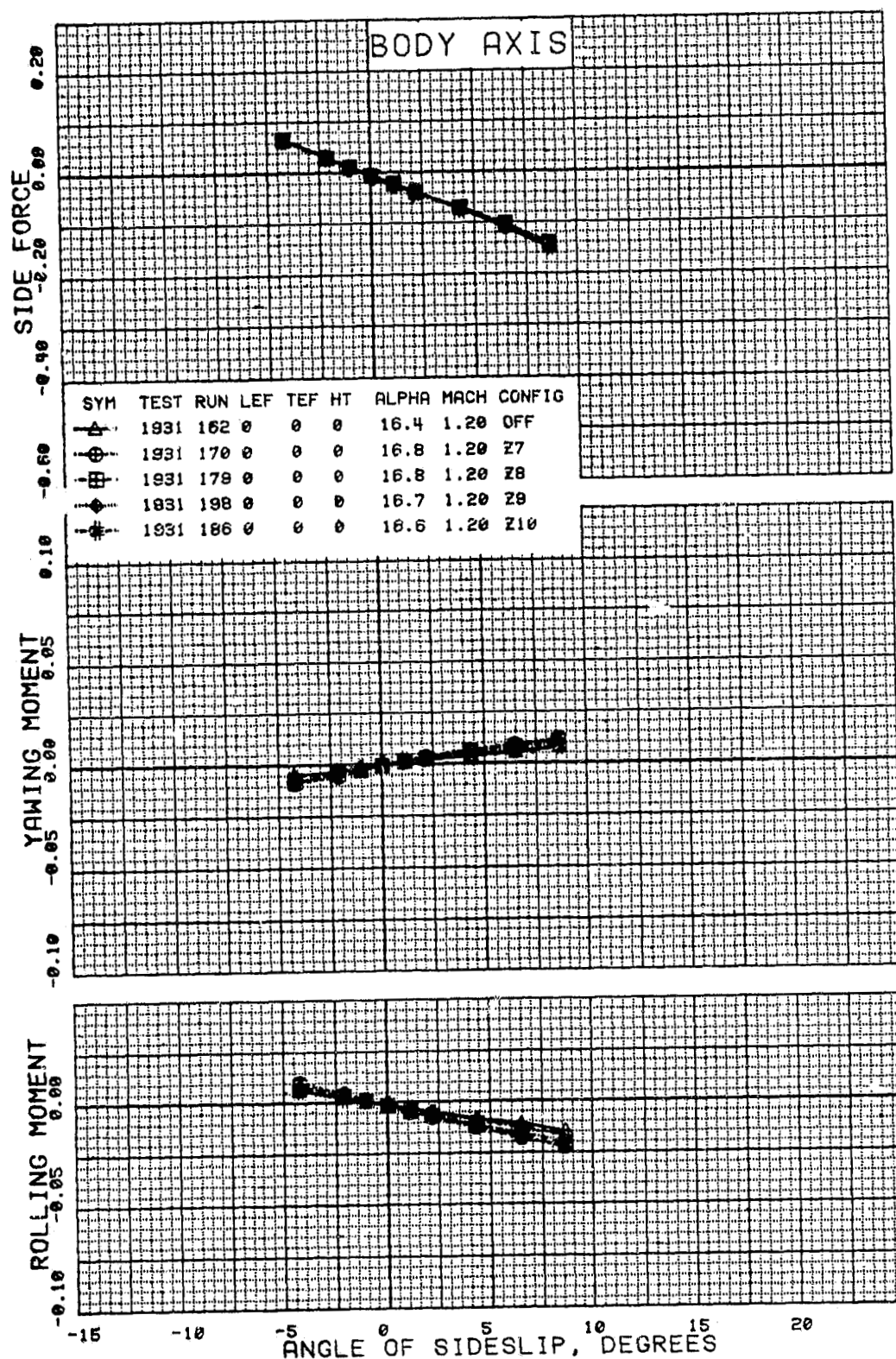


Figure 4-25 (c) Force and Moments, $\alpha = 17^\circ$

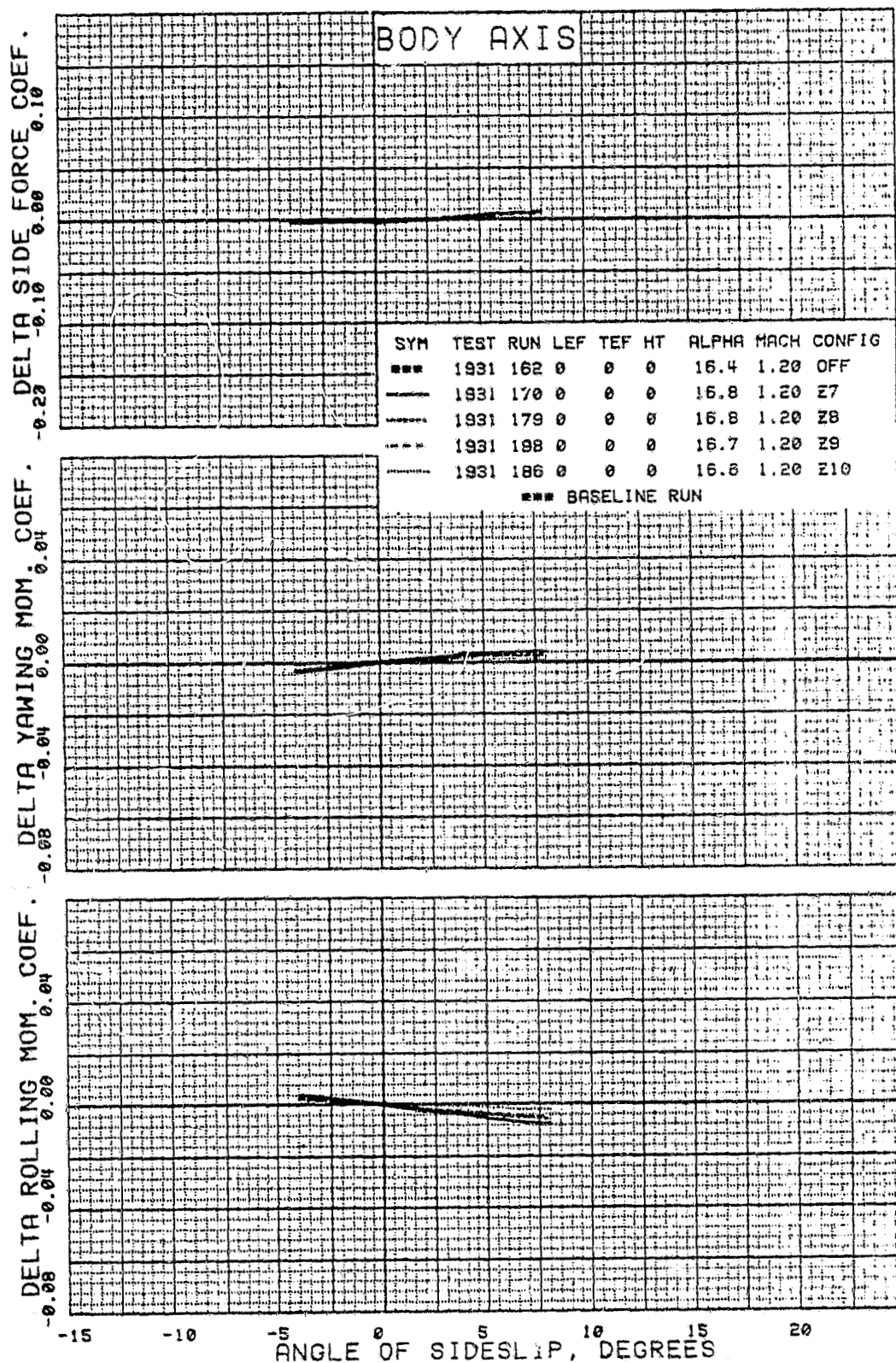


Figure 4-25 (d) Increments, $\alpha = 17^\circ$

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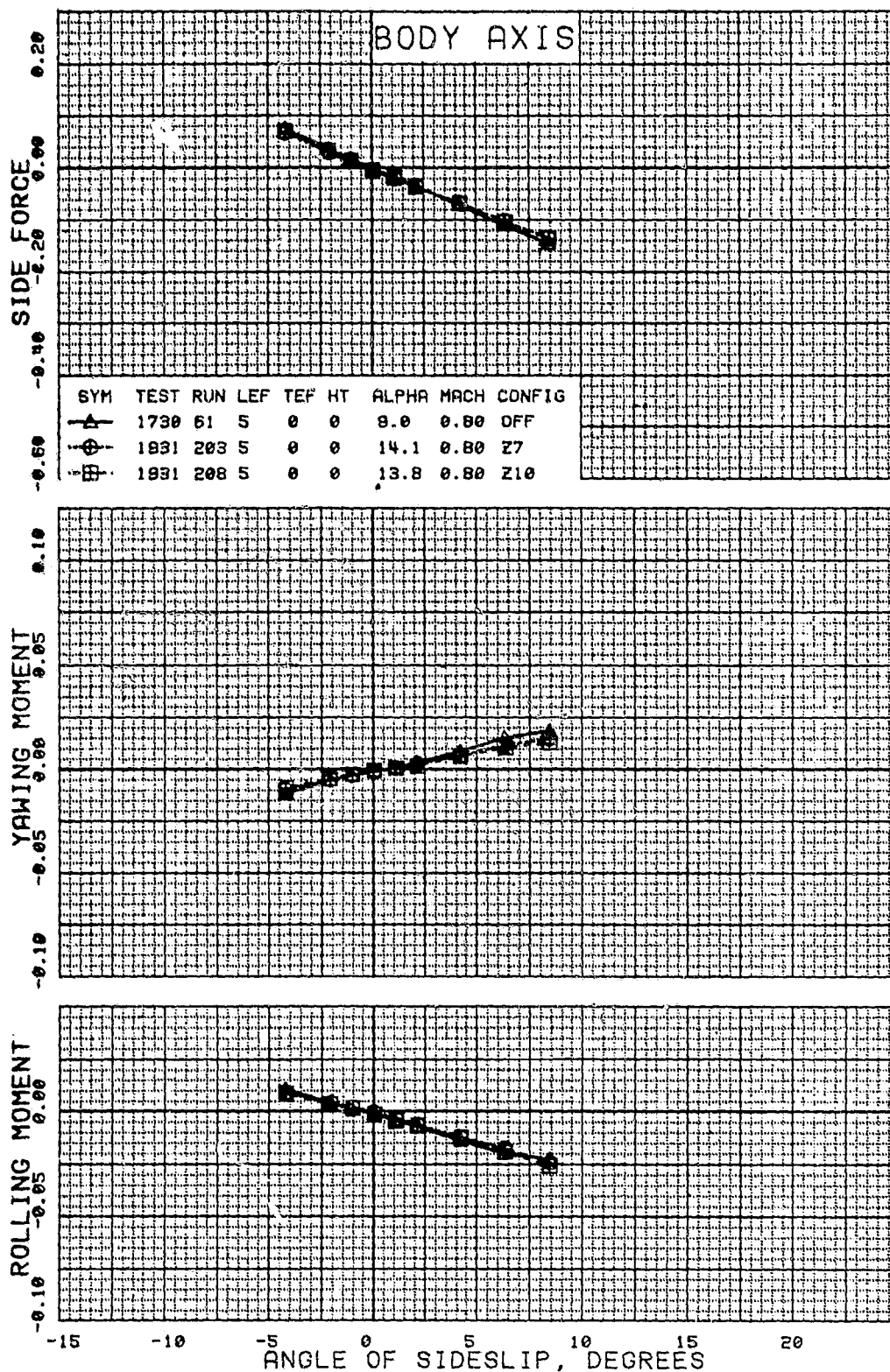


Figure 4-26 Effect of Delta Planform Forebody Strakes
(Z7, Z10), Configuration 785, LEF = 5°
M = 0.80
(a) Force and Moments, $\alpha = 14^\circ$

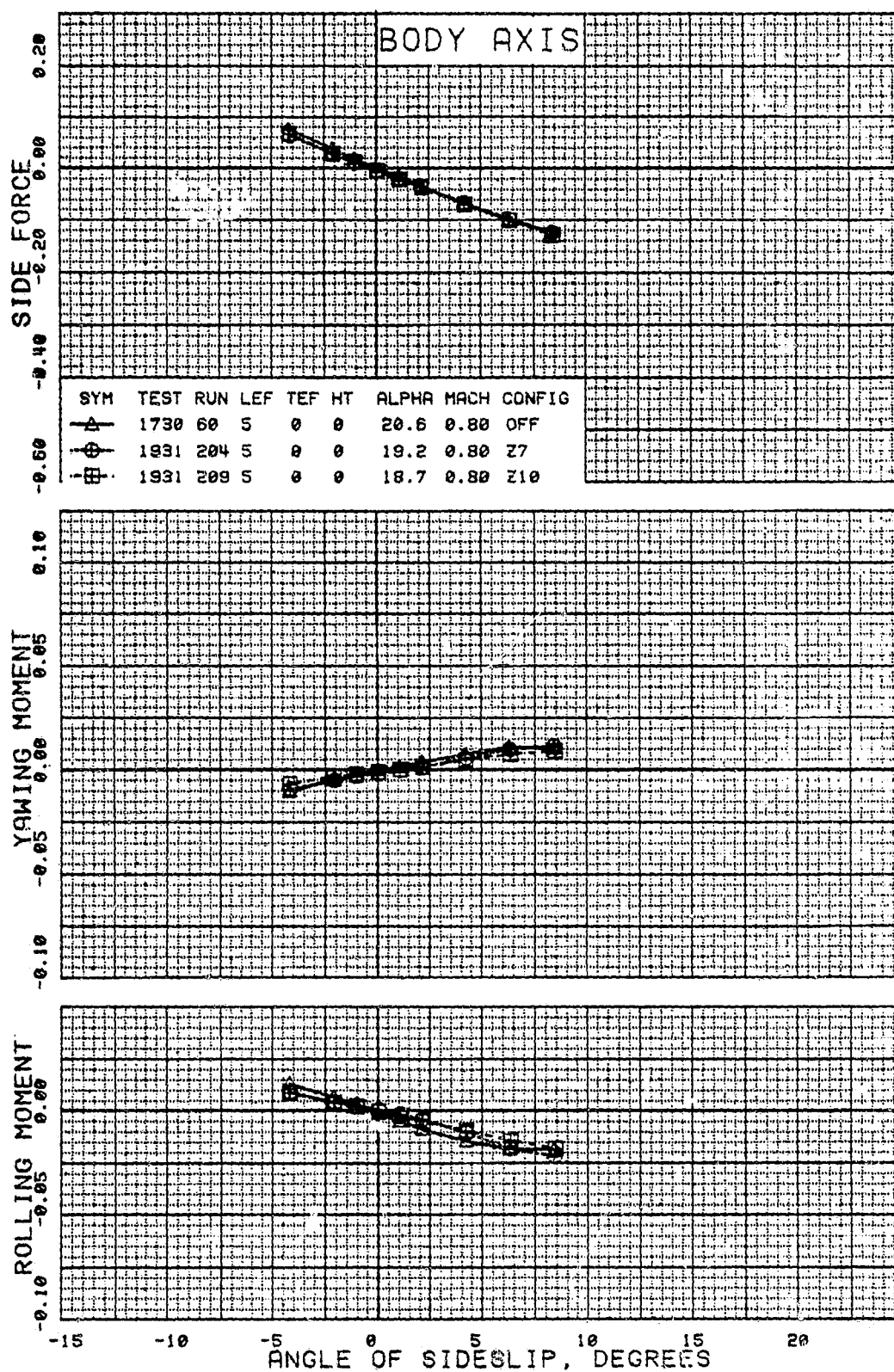


Figure 4-26 (b) Force and Moments, $\alpha = 20^\circ$

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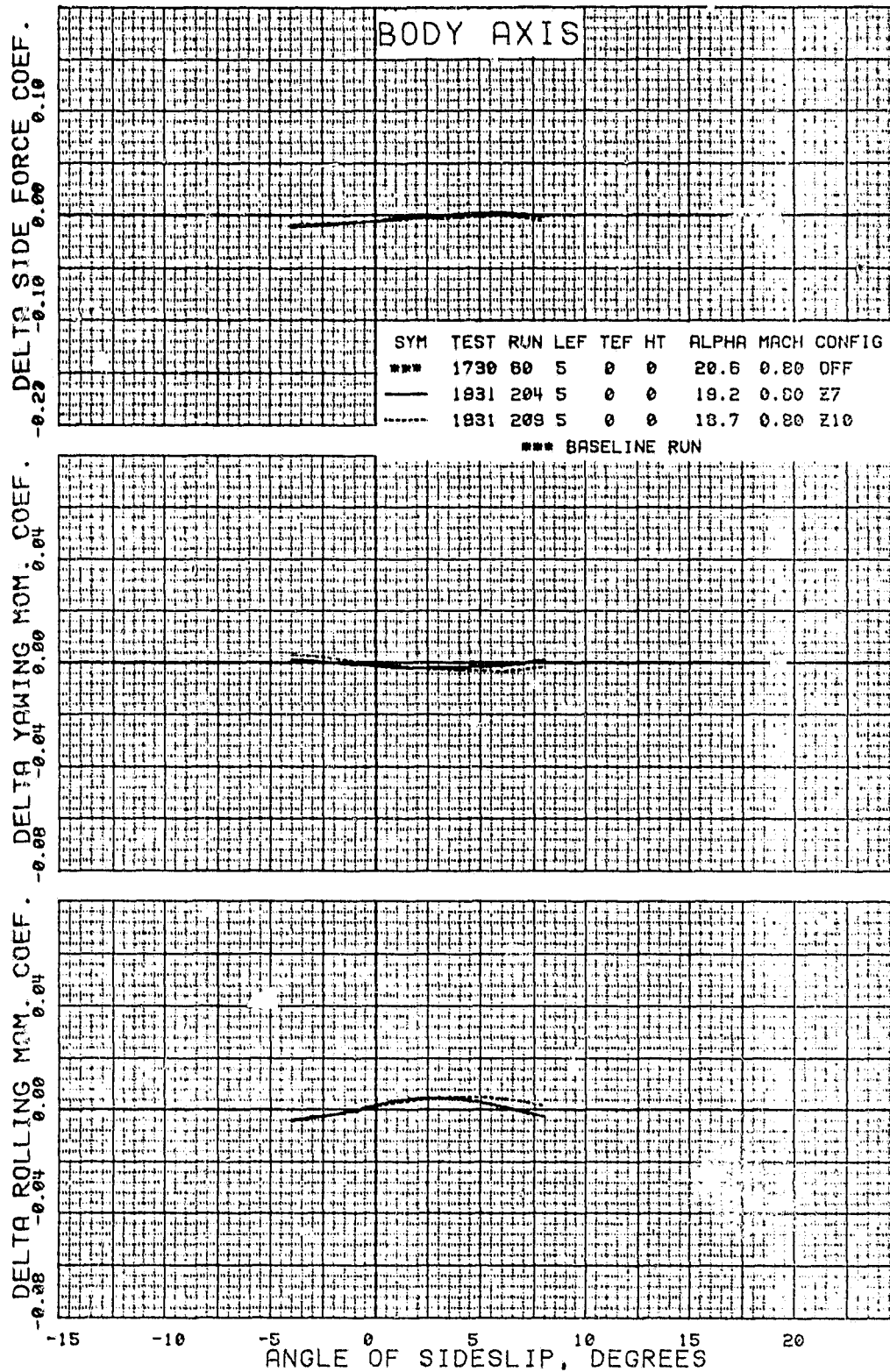


Figure 4-26 (c) Increments, $\alpha = 20^\circ$

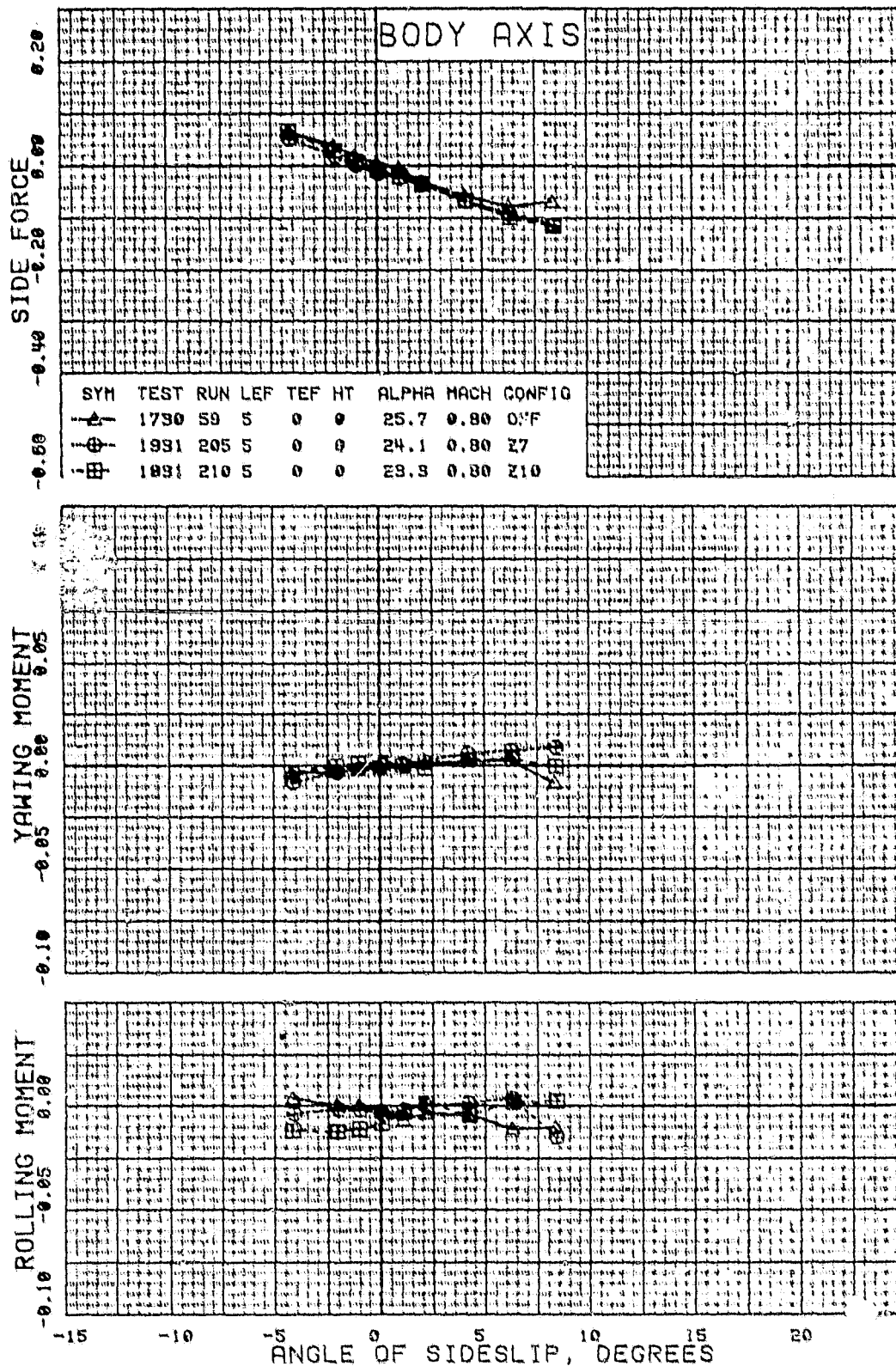


Figure 4-26 (d) Force and Moments, $\alpha = 24^\circ$

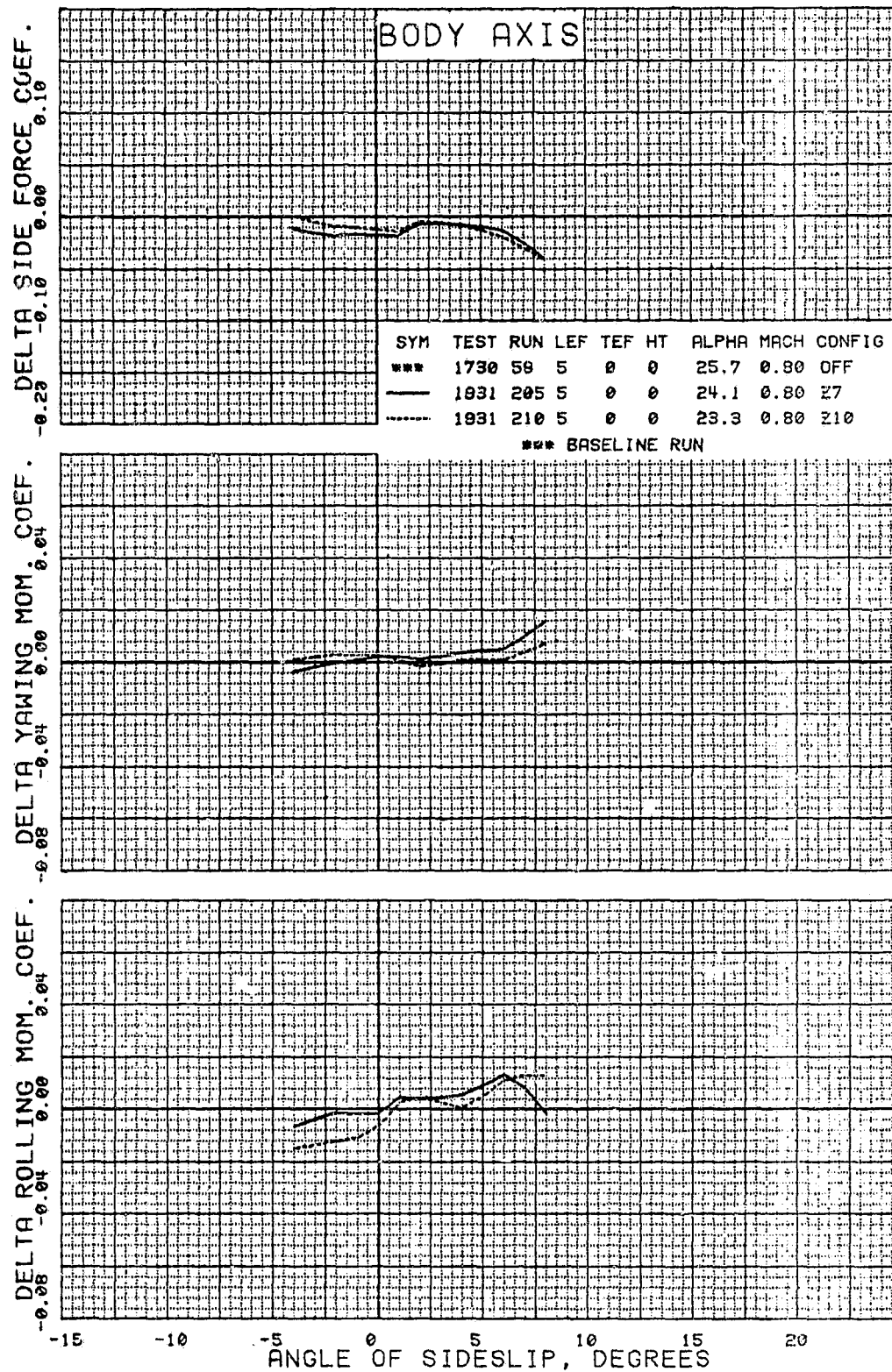


Figure 4-26 (e) Increments, $\alpha = 24^\circ$

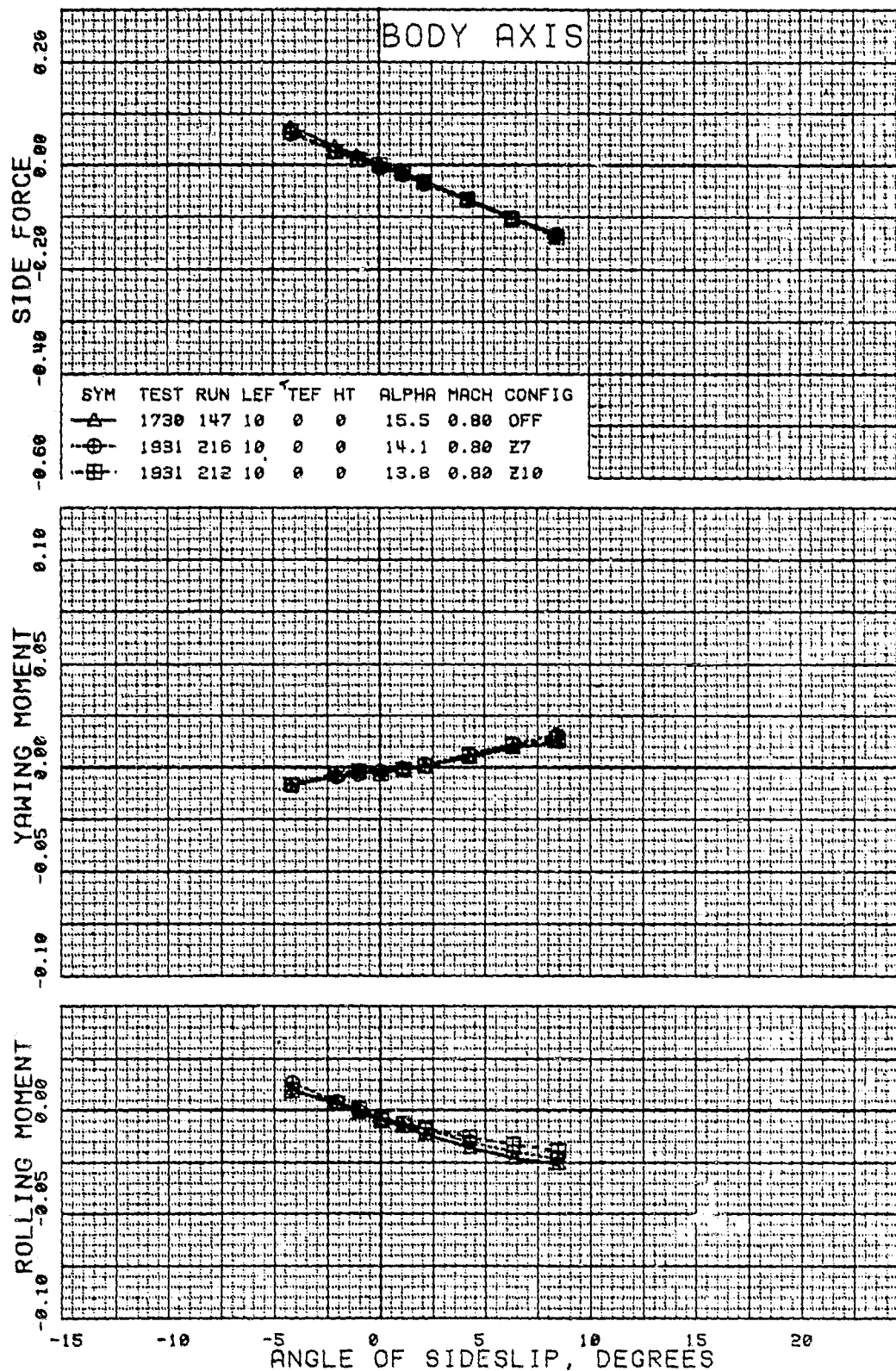


Figure 4-27 Effect of Delta Planform Forebody Strakes (Z7, Z10), Configuration 785, LEF = 10°, M = 0.80
(a) Force and Moments, $\alpha = 14^\circ$

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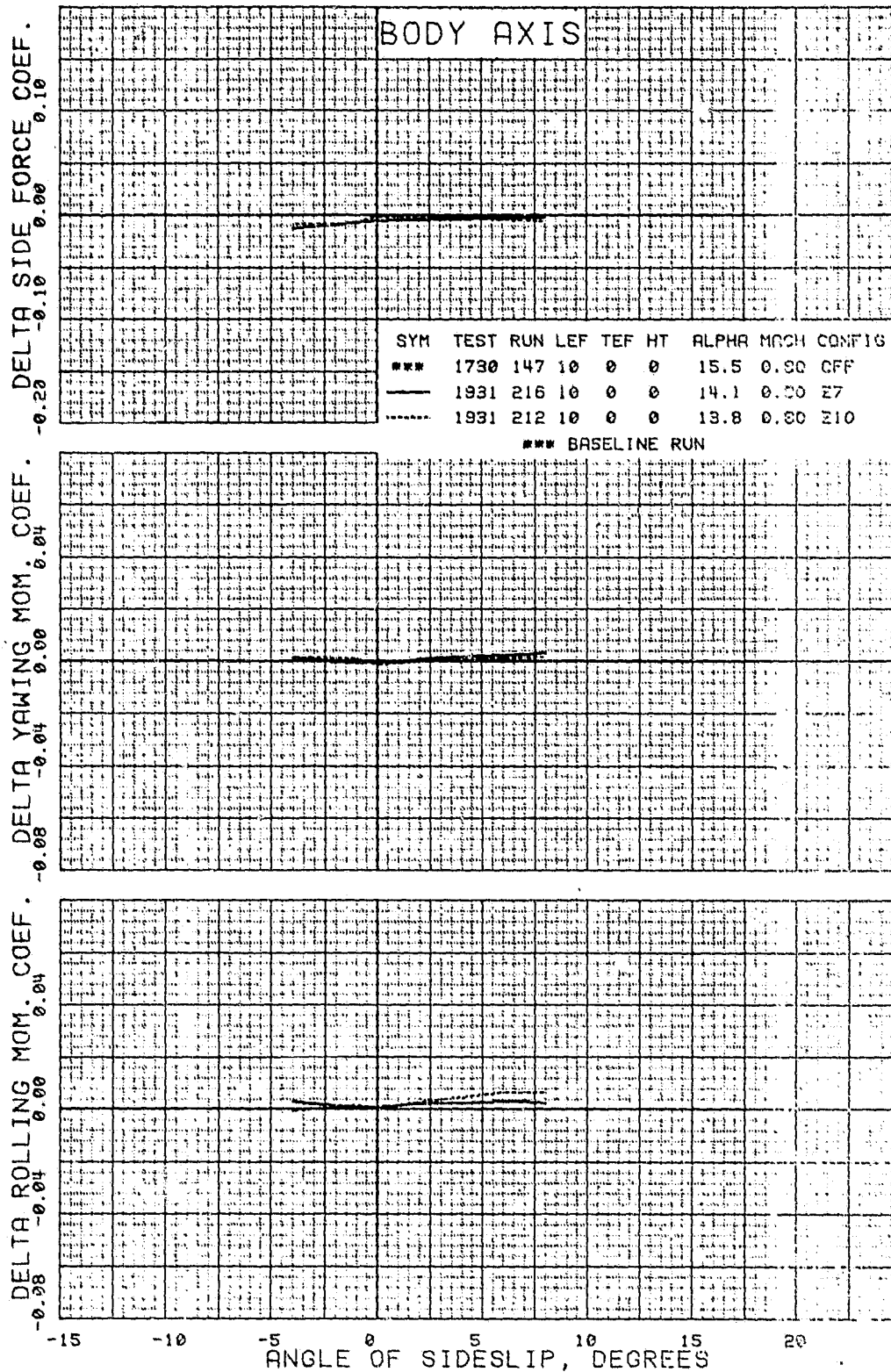


Figure 4-27 (b) Increments, $\alpha = 14^\circ$

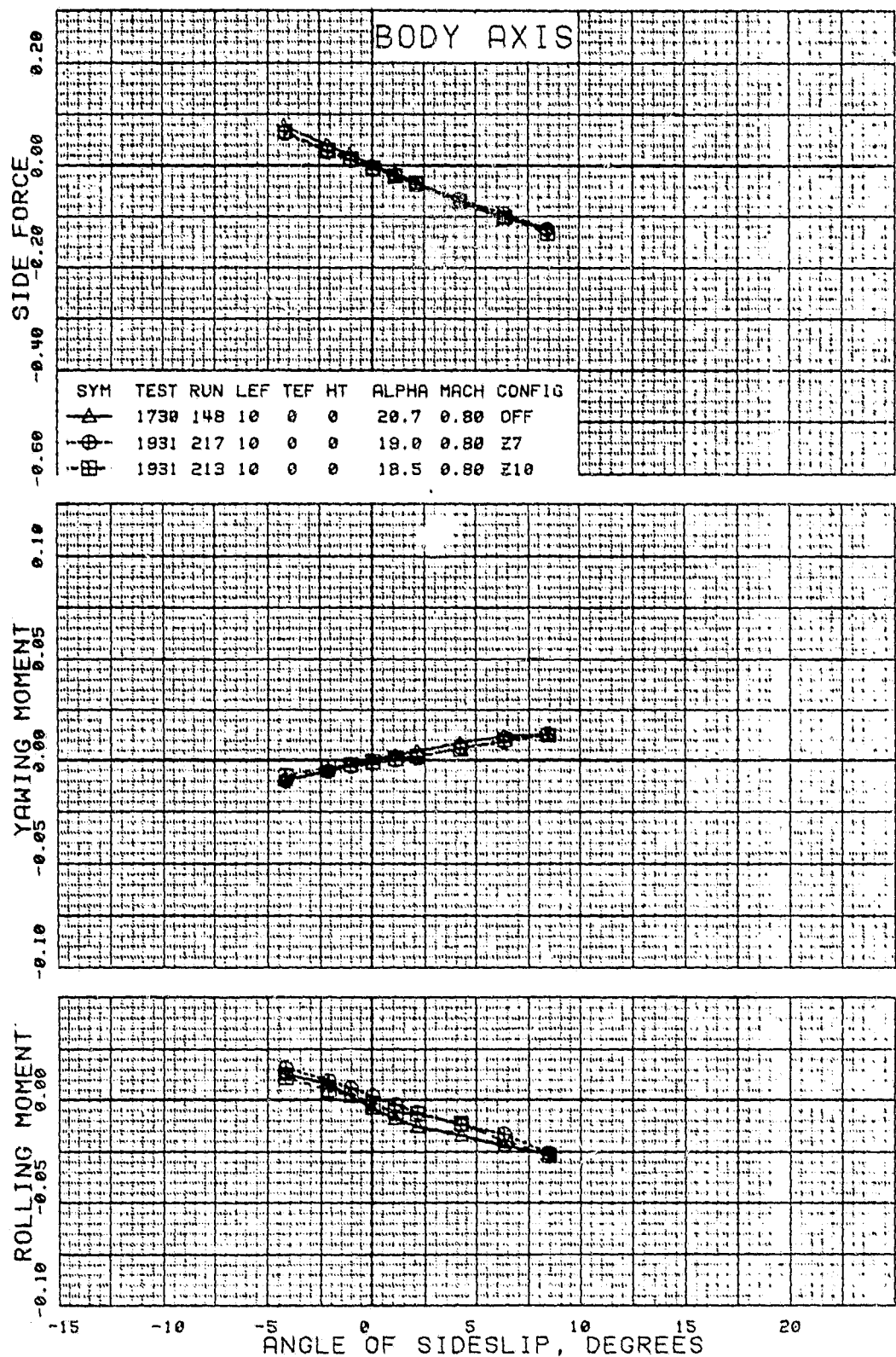


Figure 4-27 (c) Force and Moments, $\alpha = 20^\circ$

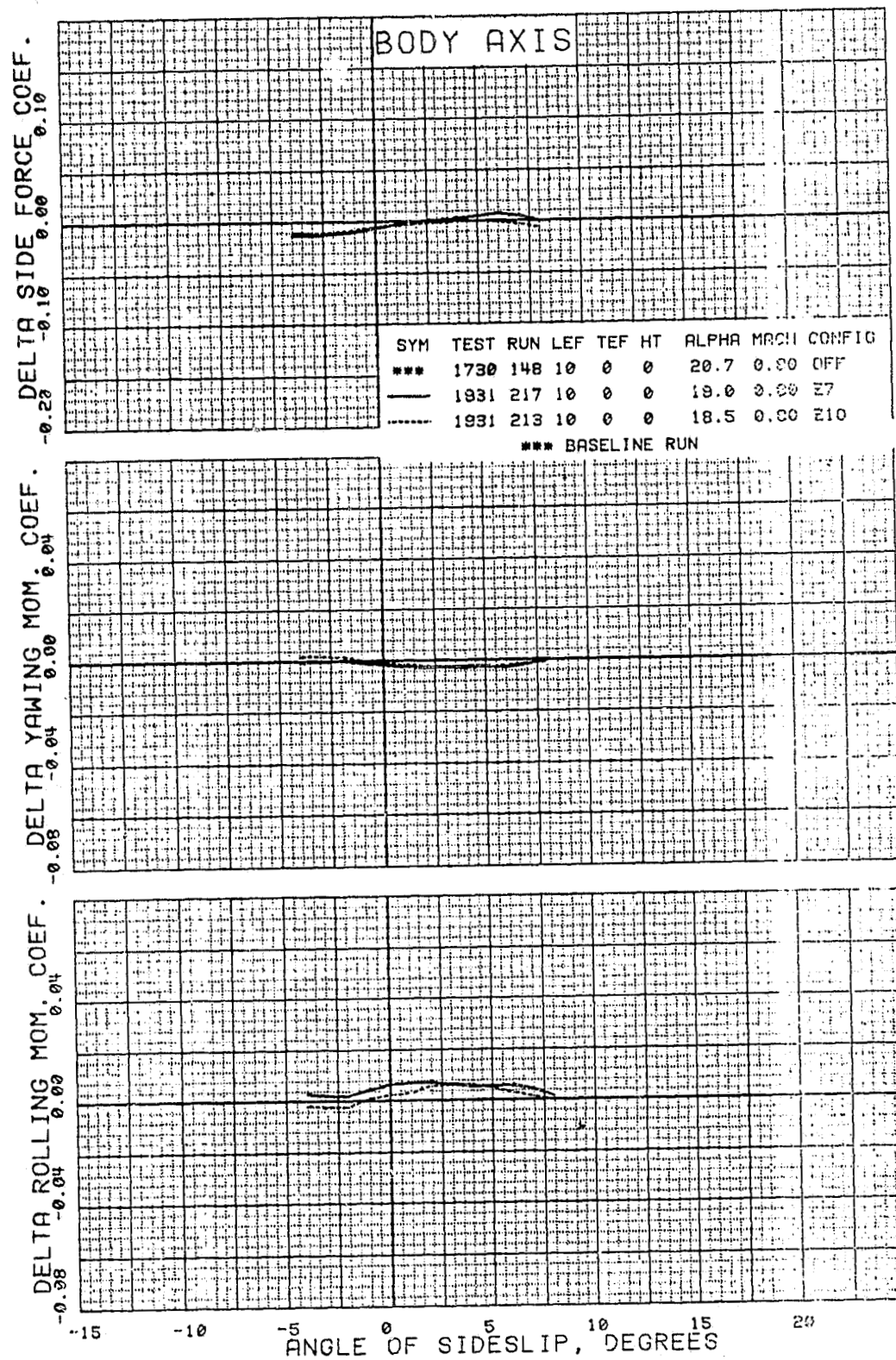


Figure 4-27 (d) Increments, $\alpha = 20^\circ$

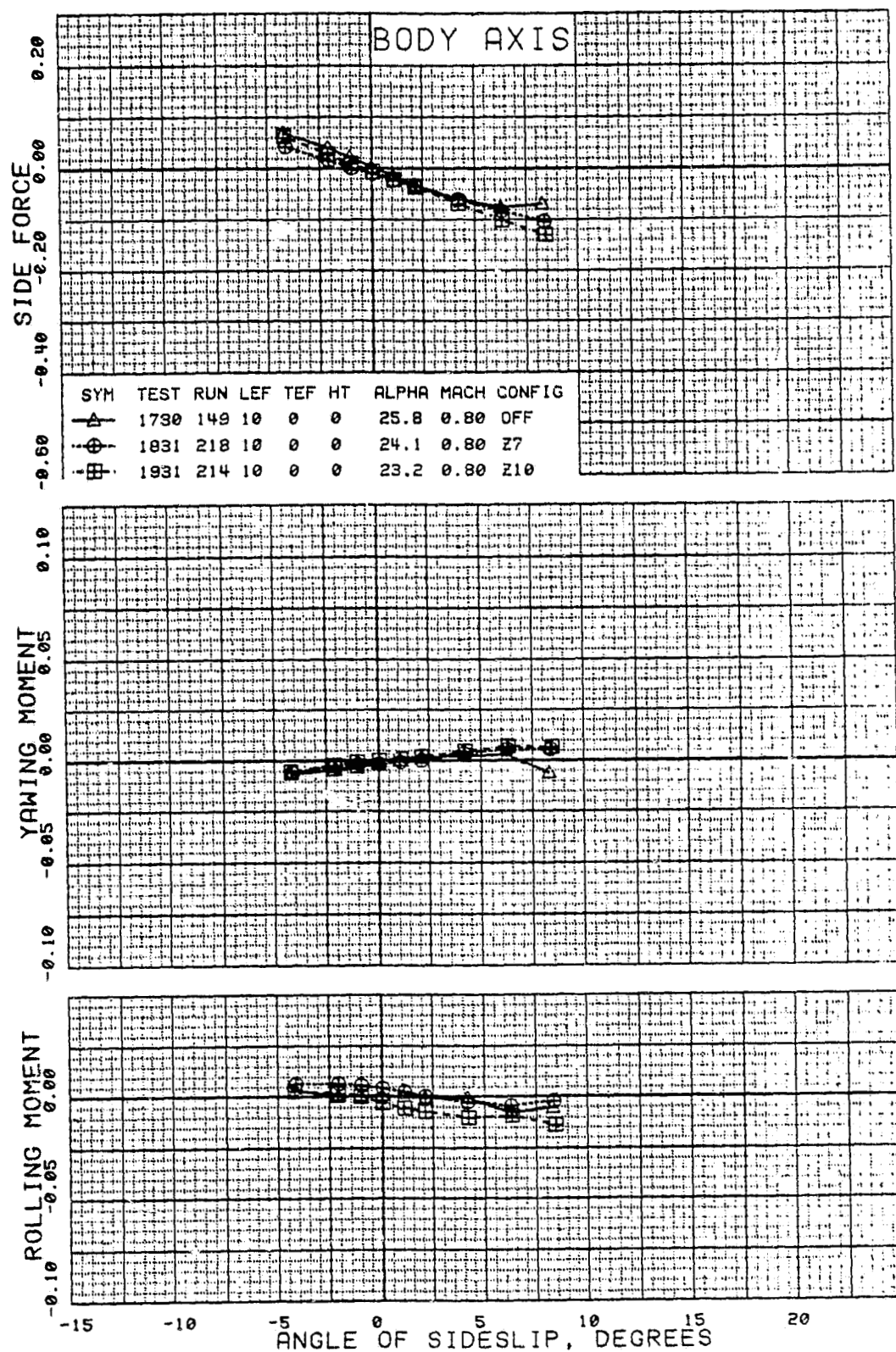


Figure 4-27 (e) Force and Moments, $\alpha = 24^\circ$

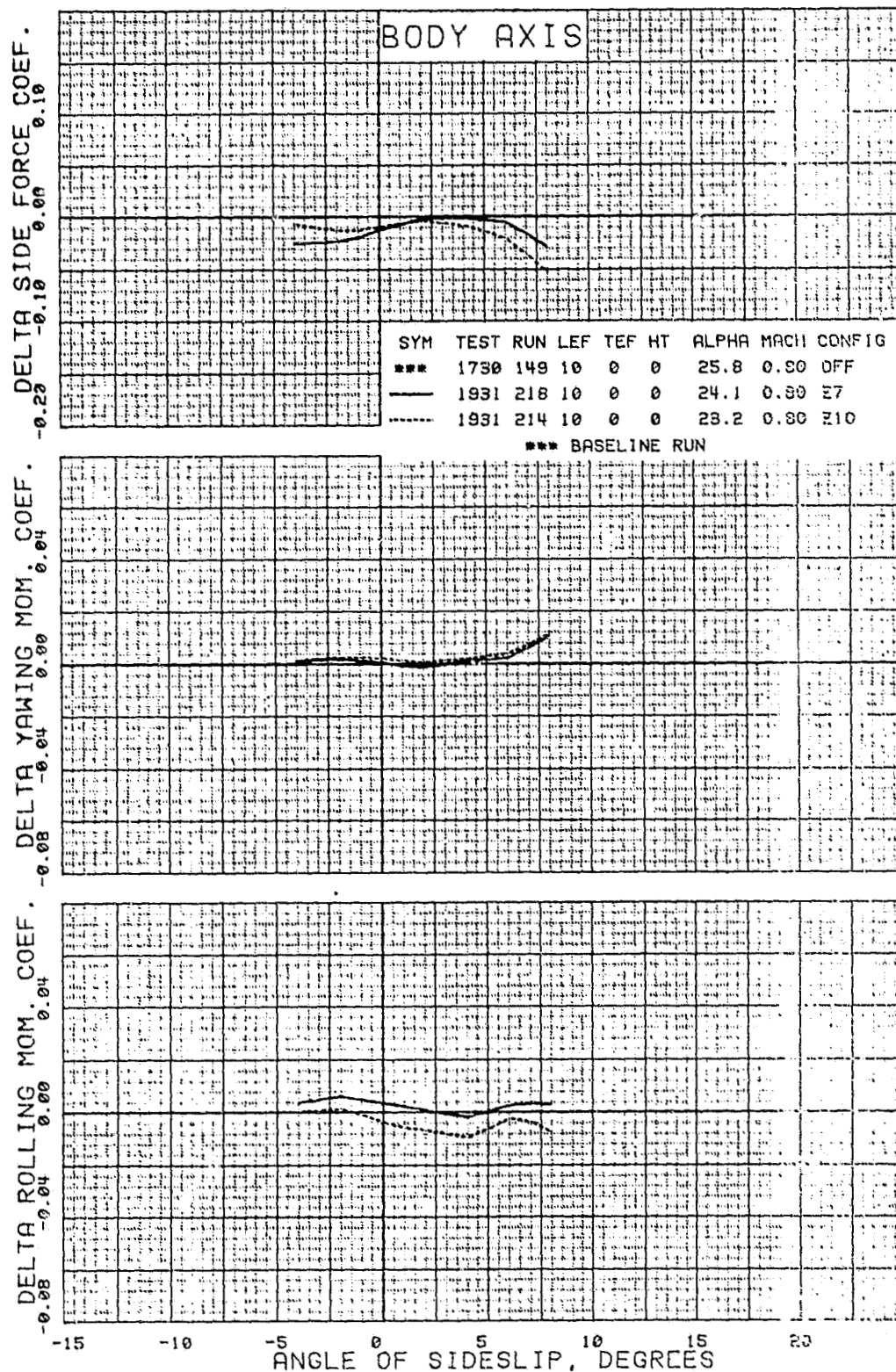


Figure 4-27 (f) Increments, $\alpha = 24^\circ$

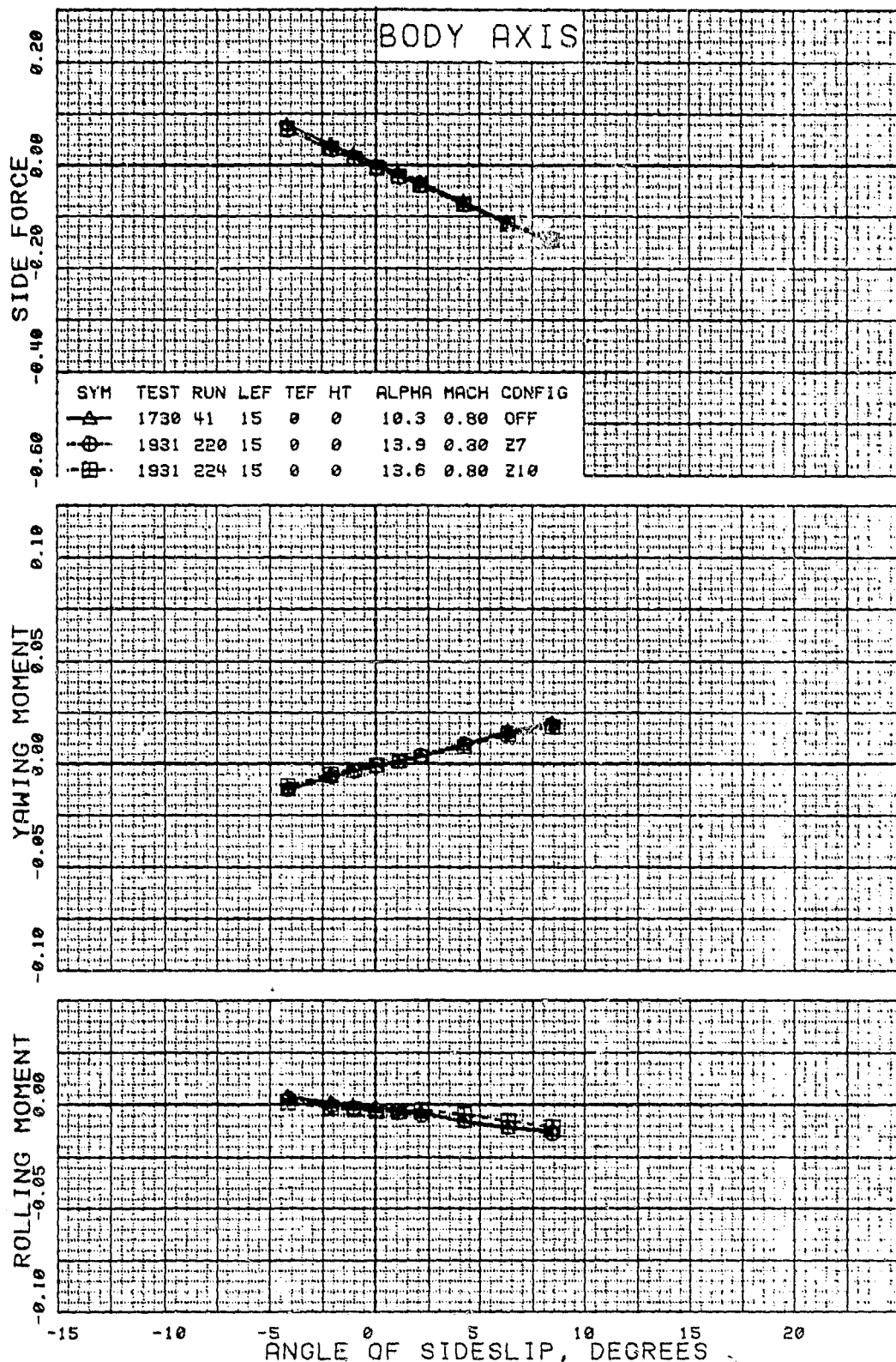


Figure 4-28 Effect of Delta Planform Forebody Strakes (Z7, Z10) Configuration 785, LEF = 15°
M = 0.80
(a) Force and Moments, $\alpha = 14^\circ$

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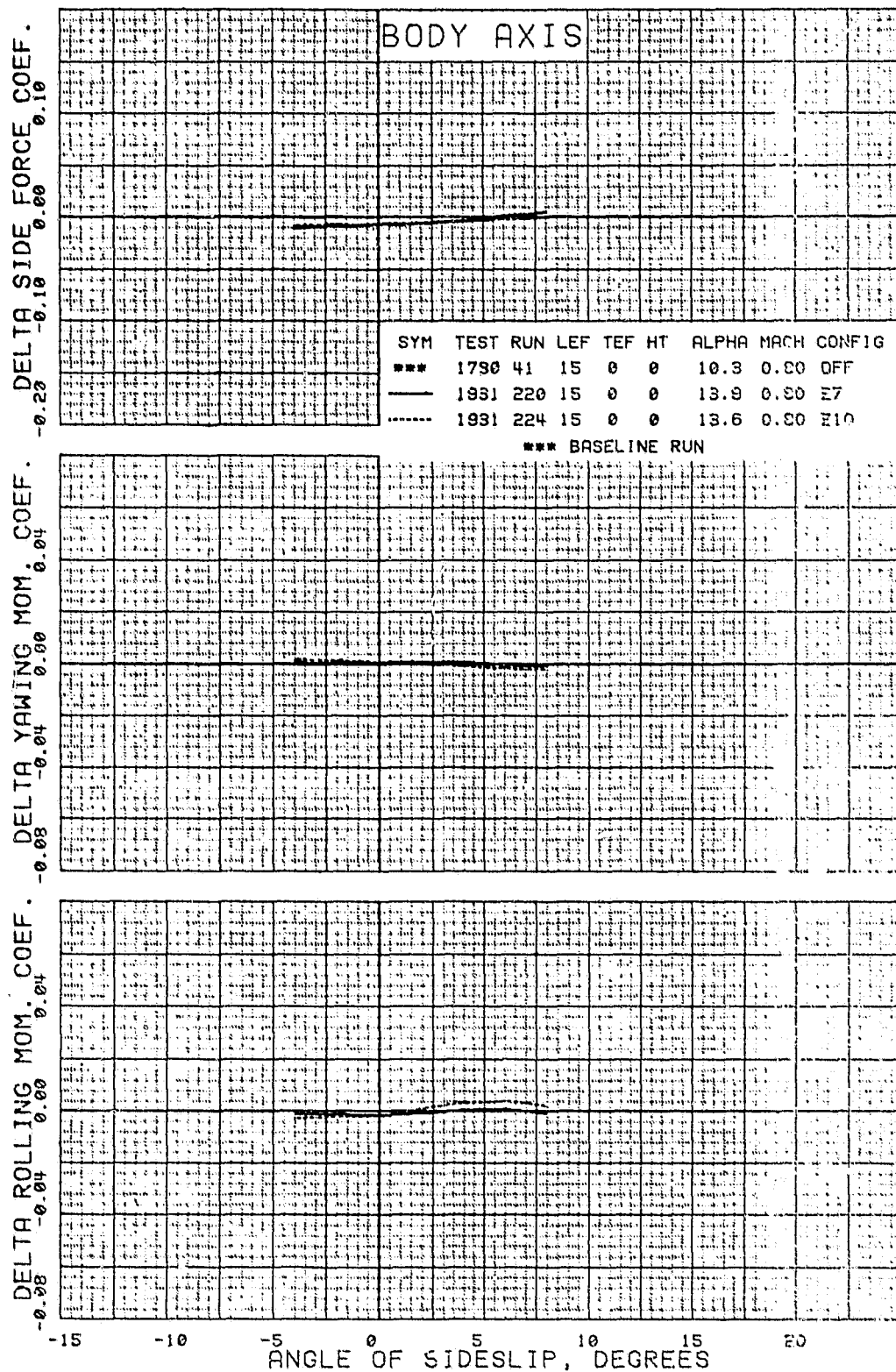


Figure 4-28 (b) Increments, $\alpha = 14^\circ$

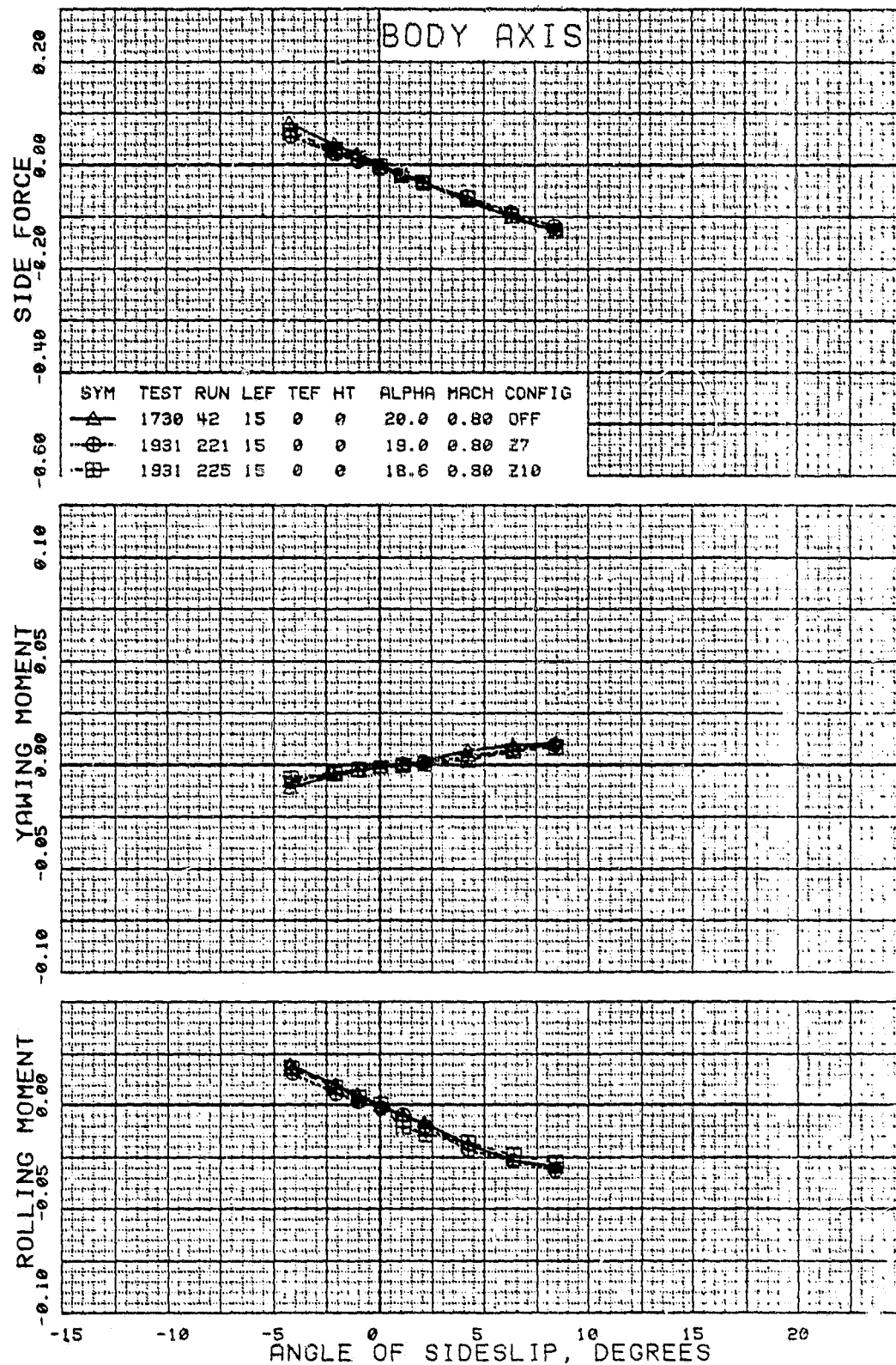


Figure 4-28 (c) Force and Moments, $\alpha = 19^\circ$

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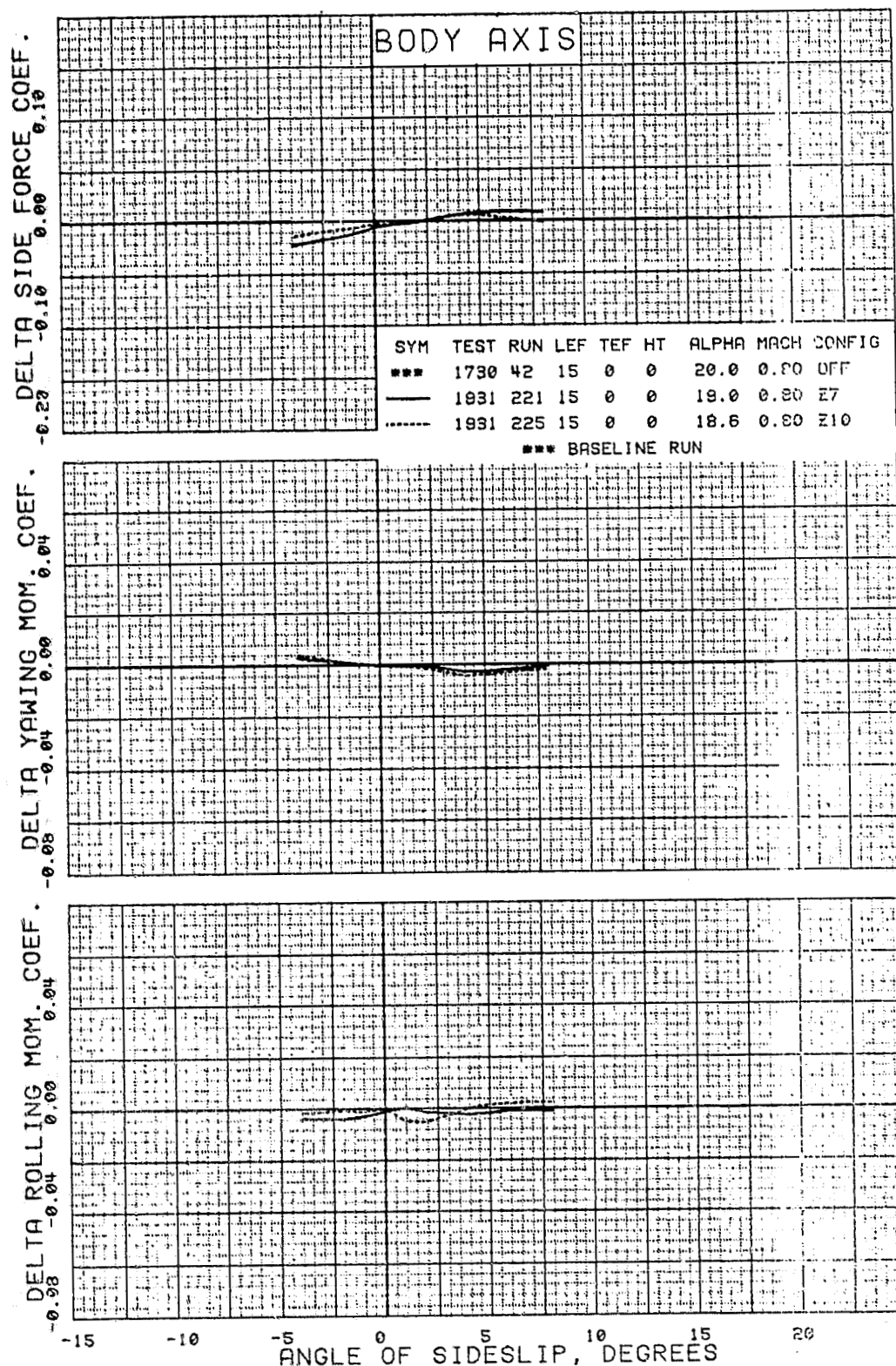


Figure 4-28 (d) Increments, $\alpha = 19^\circ$

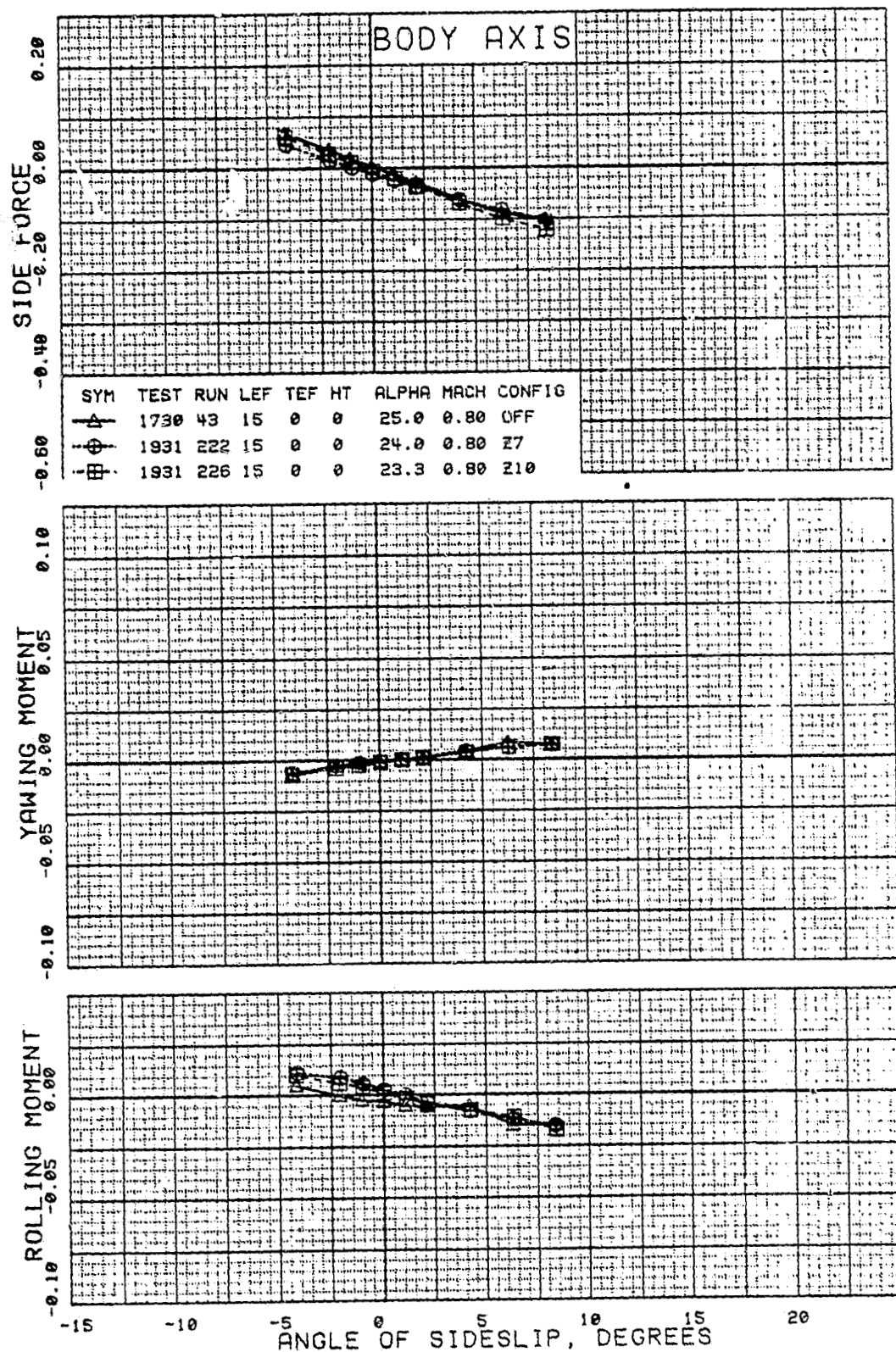


Figure 4-28 (e) Force and Moments, $\alpha = 24^\circ$

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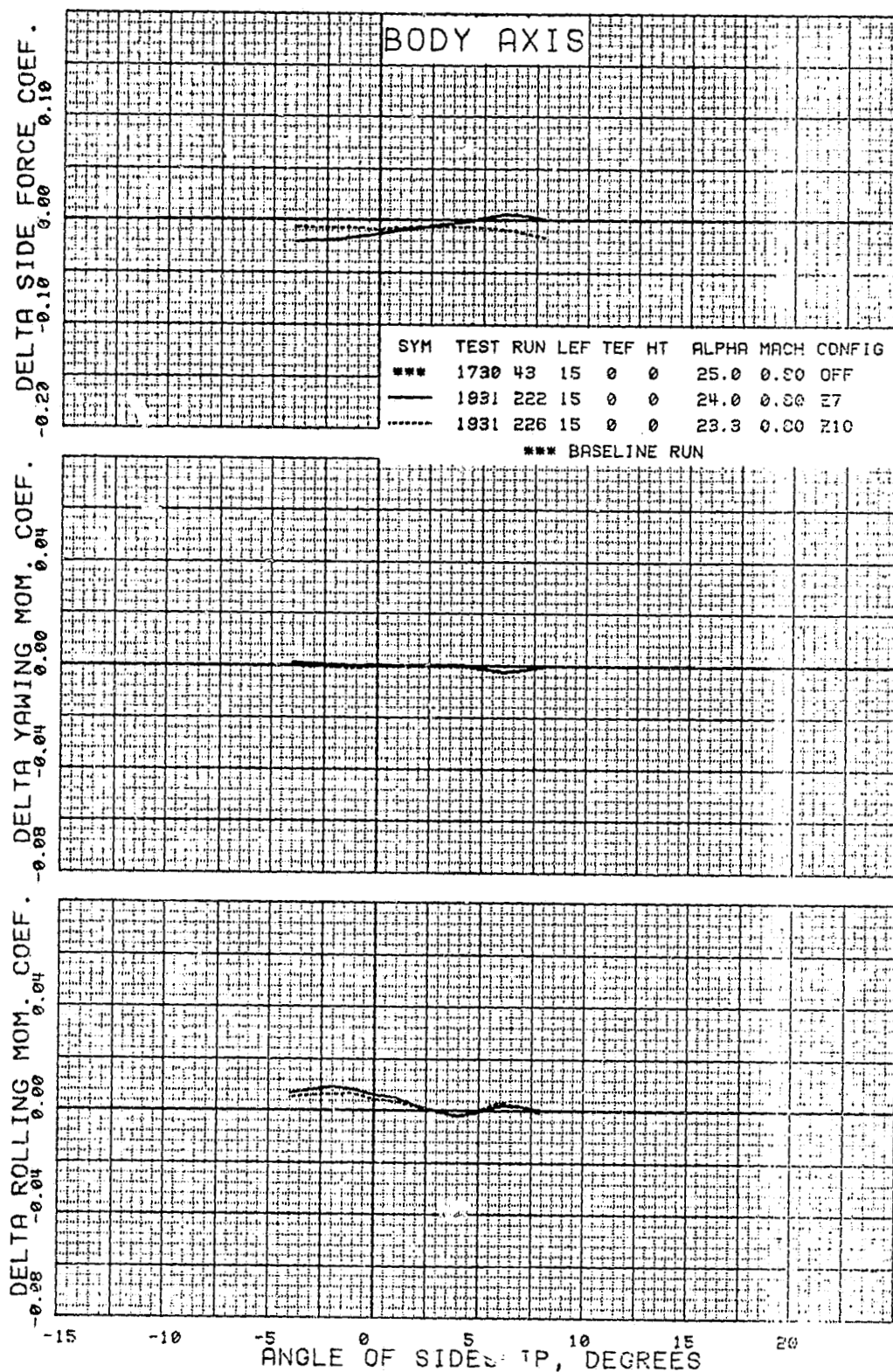


Figure 4-28 (f) Increments, $\alpha = 24^\circ$

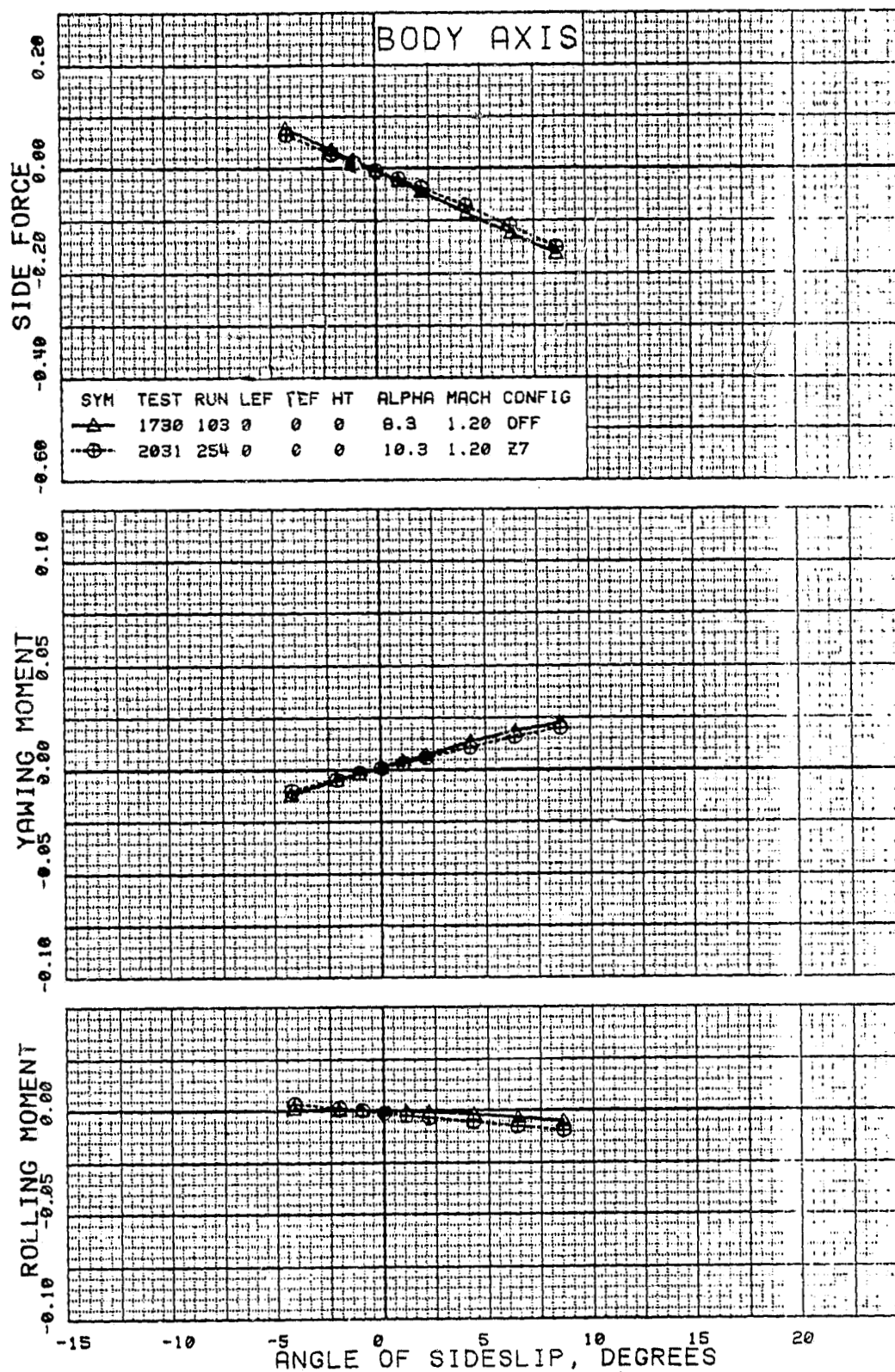


Figure 4-29 Effect of Forebody Strake Z7, Configuration 786, $M = 1.20$

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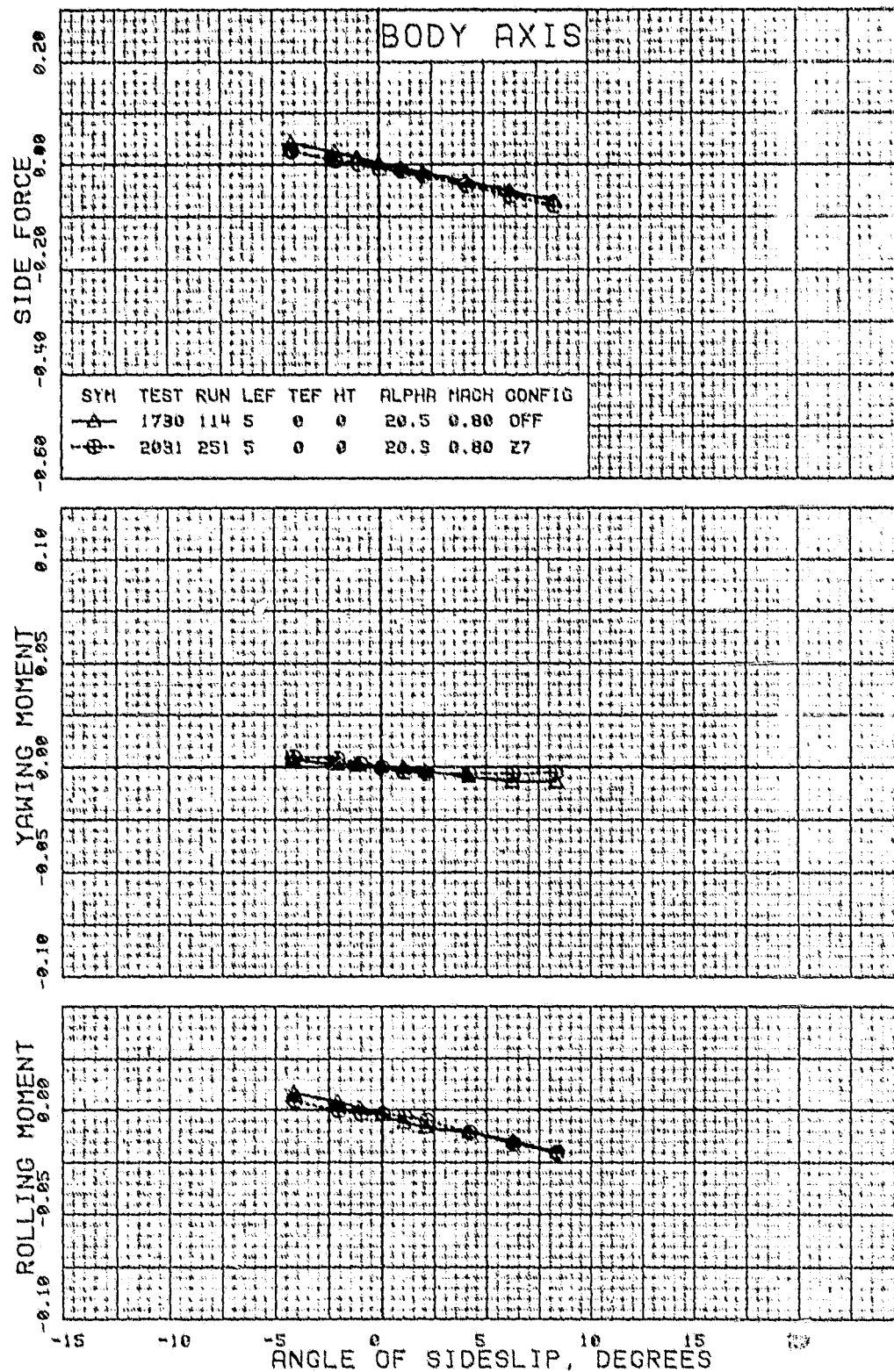


Figure 4-30 Effect of Forebody Strake Z7, Configuration 786, LEF = 5°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

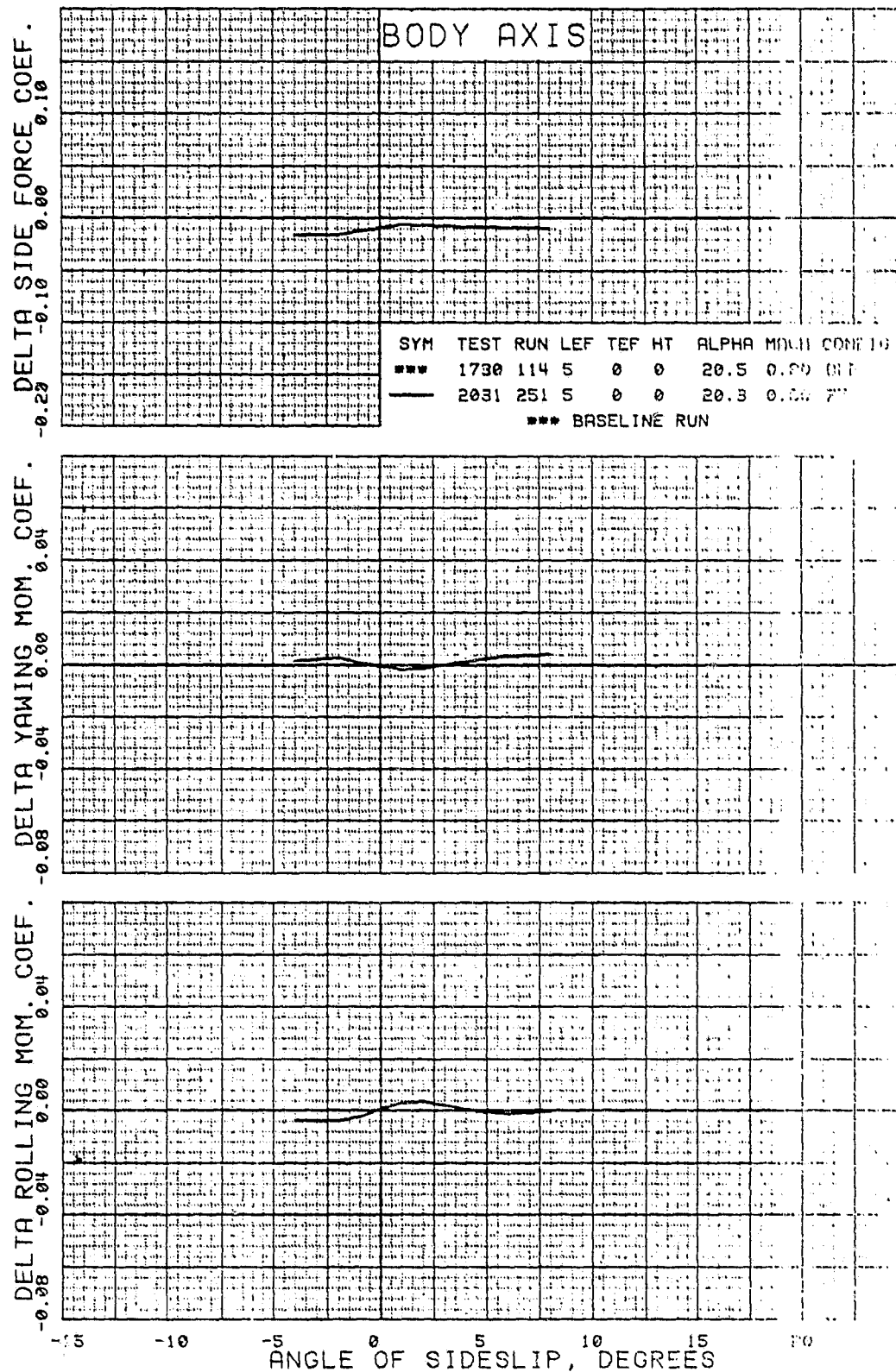


Figure 4-30 (b) Increments, $\alpha = 20^\circ$

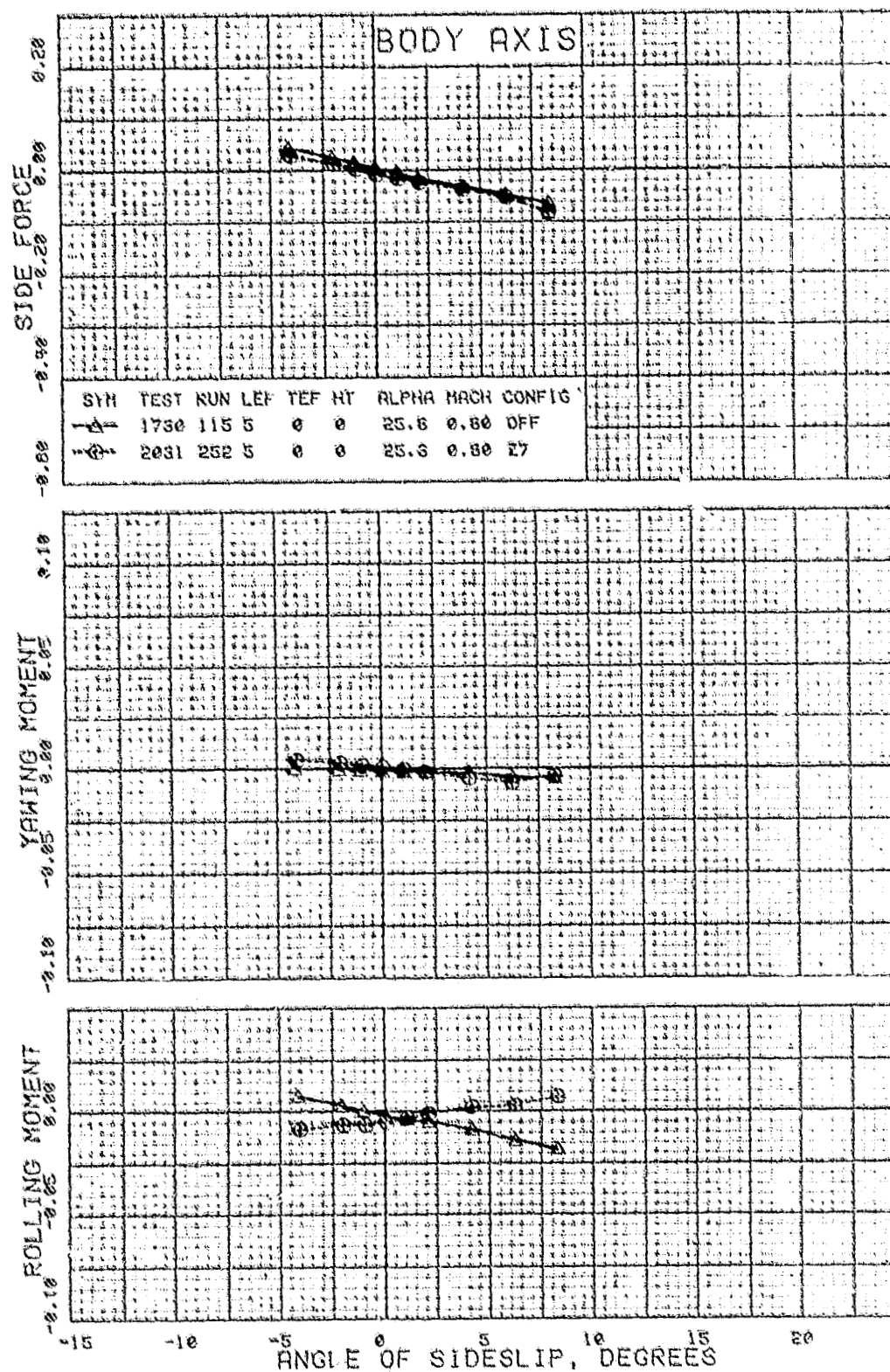


Figure 4-30 (c) Force and Moments, $\alpha = 25^\circ$

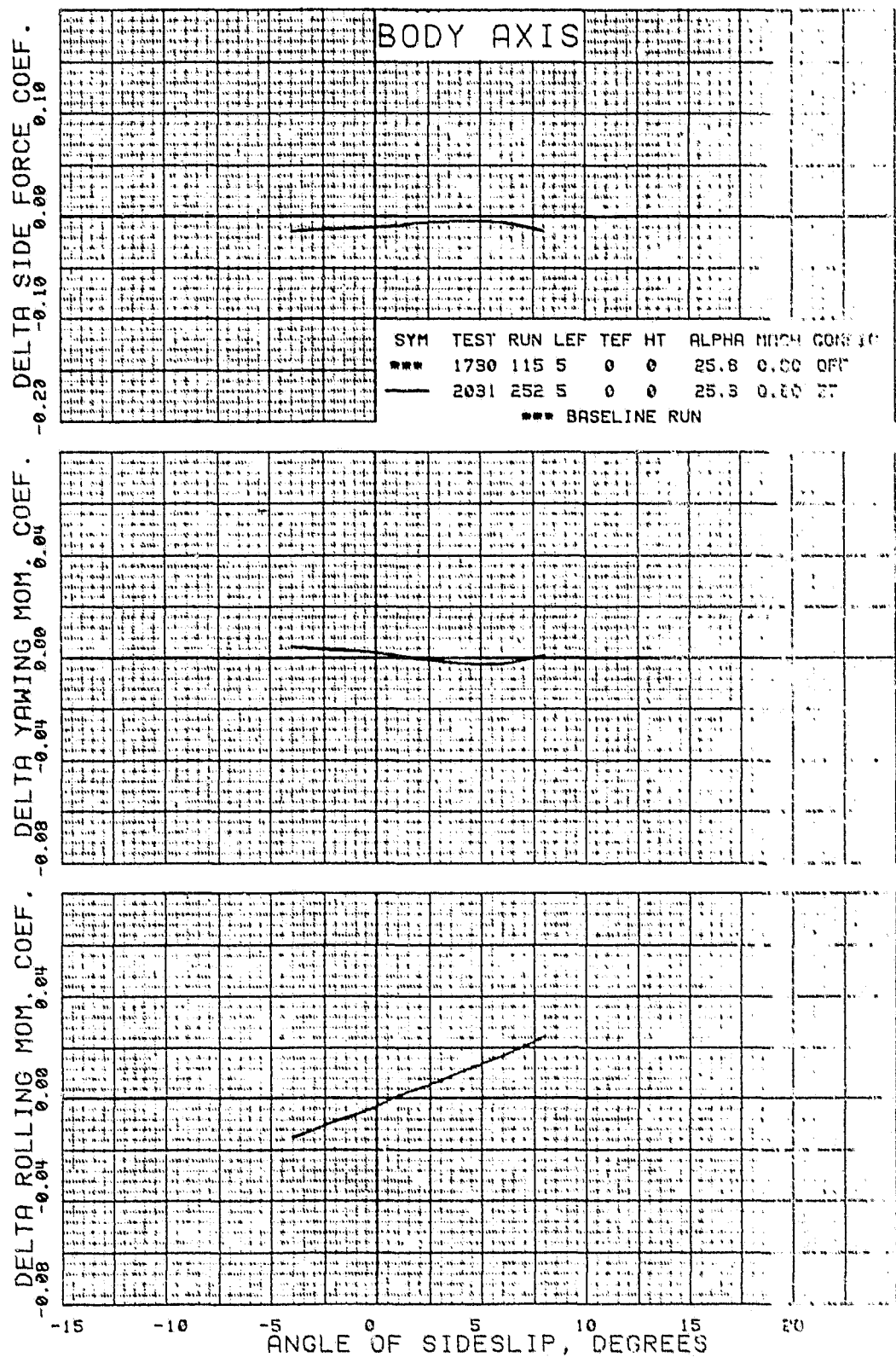


Figure 4-30 (d) Increments, $\alpha = 25^\circ$

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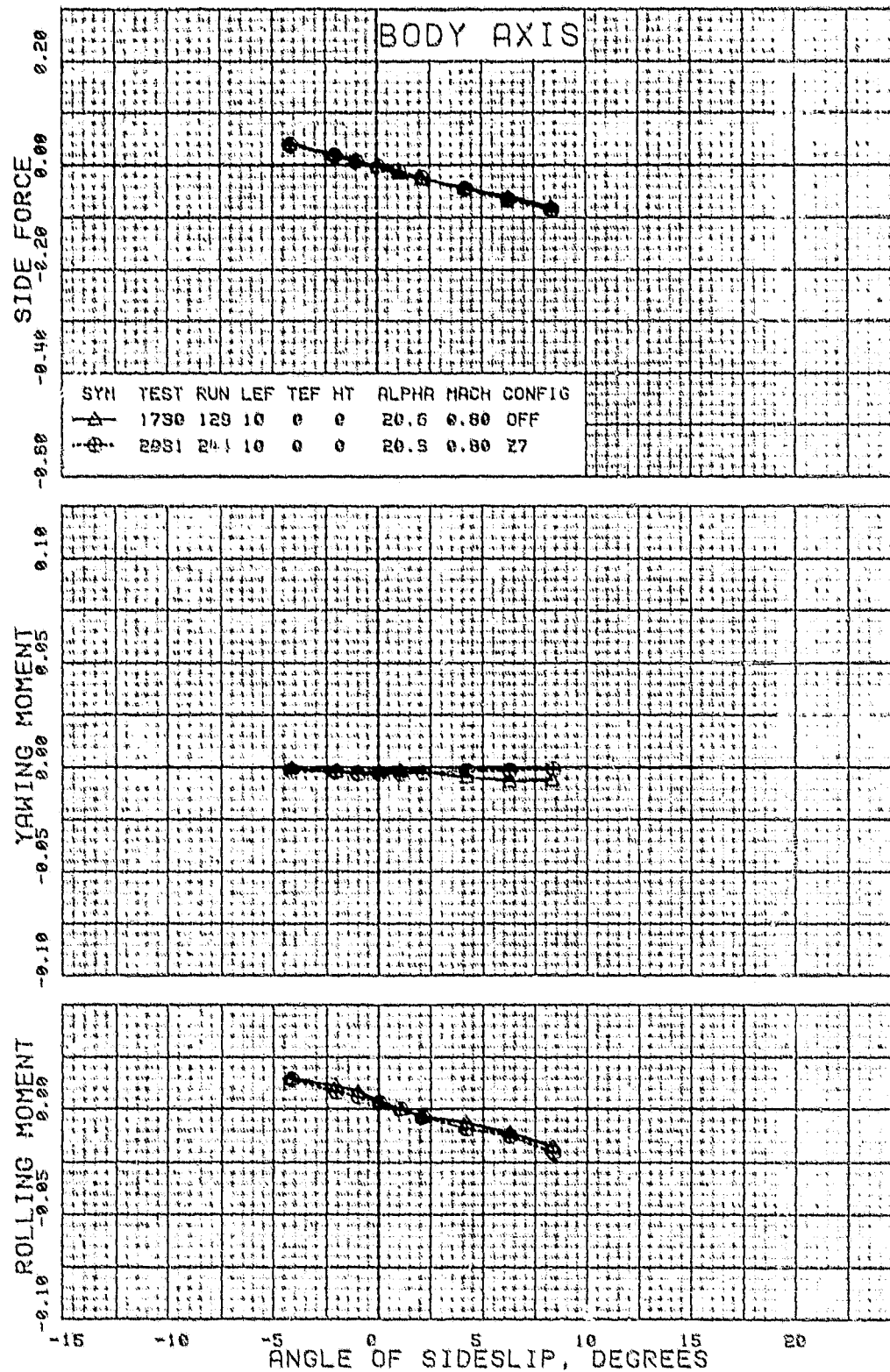


Figure 4-31 Effect of Forebody Strake Z7, Configura-
tion 786, LEF = 10°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

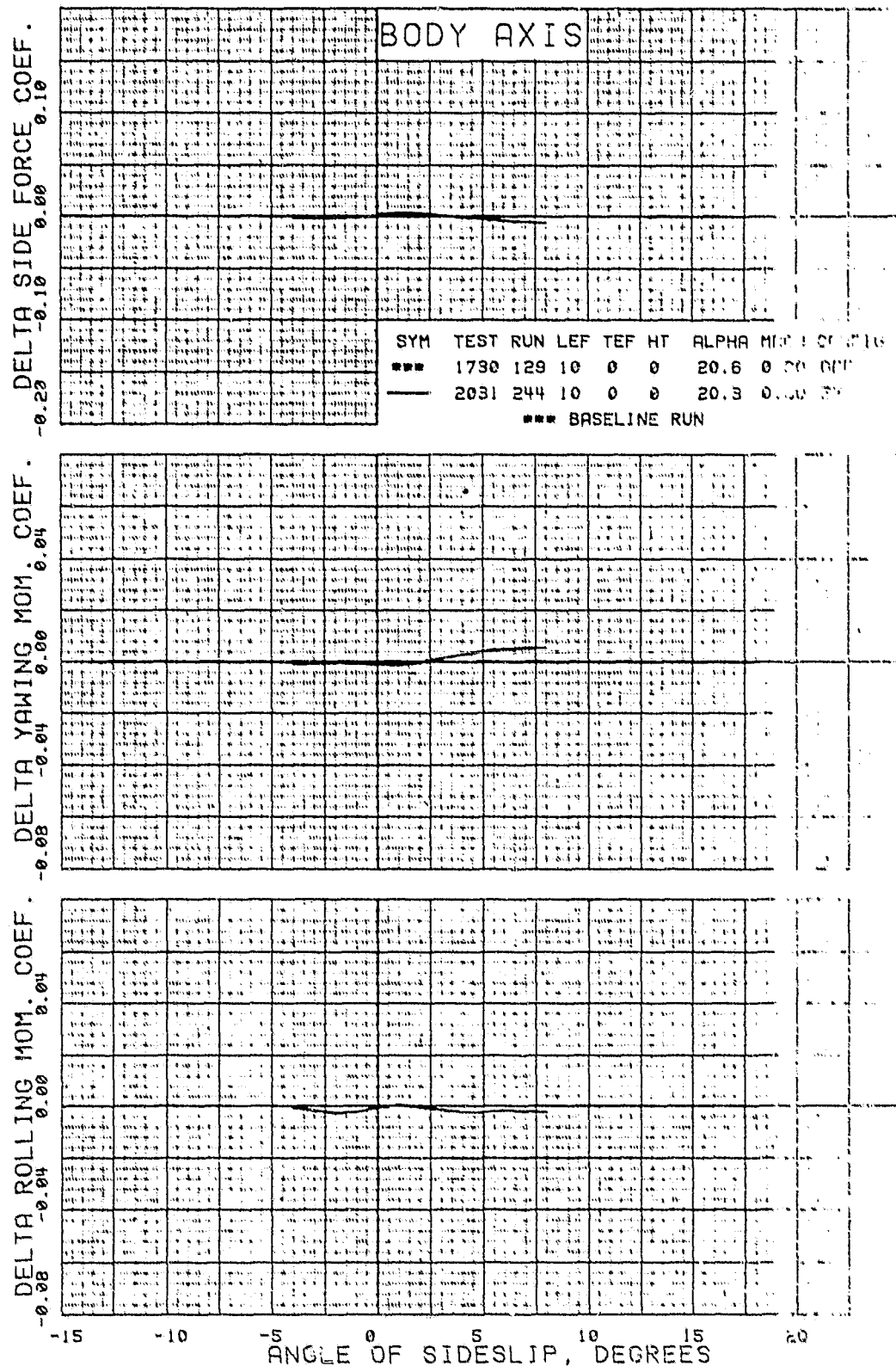


Figure 4-31 (b) Increments, $\alpha = 20^\circ$

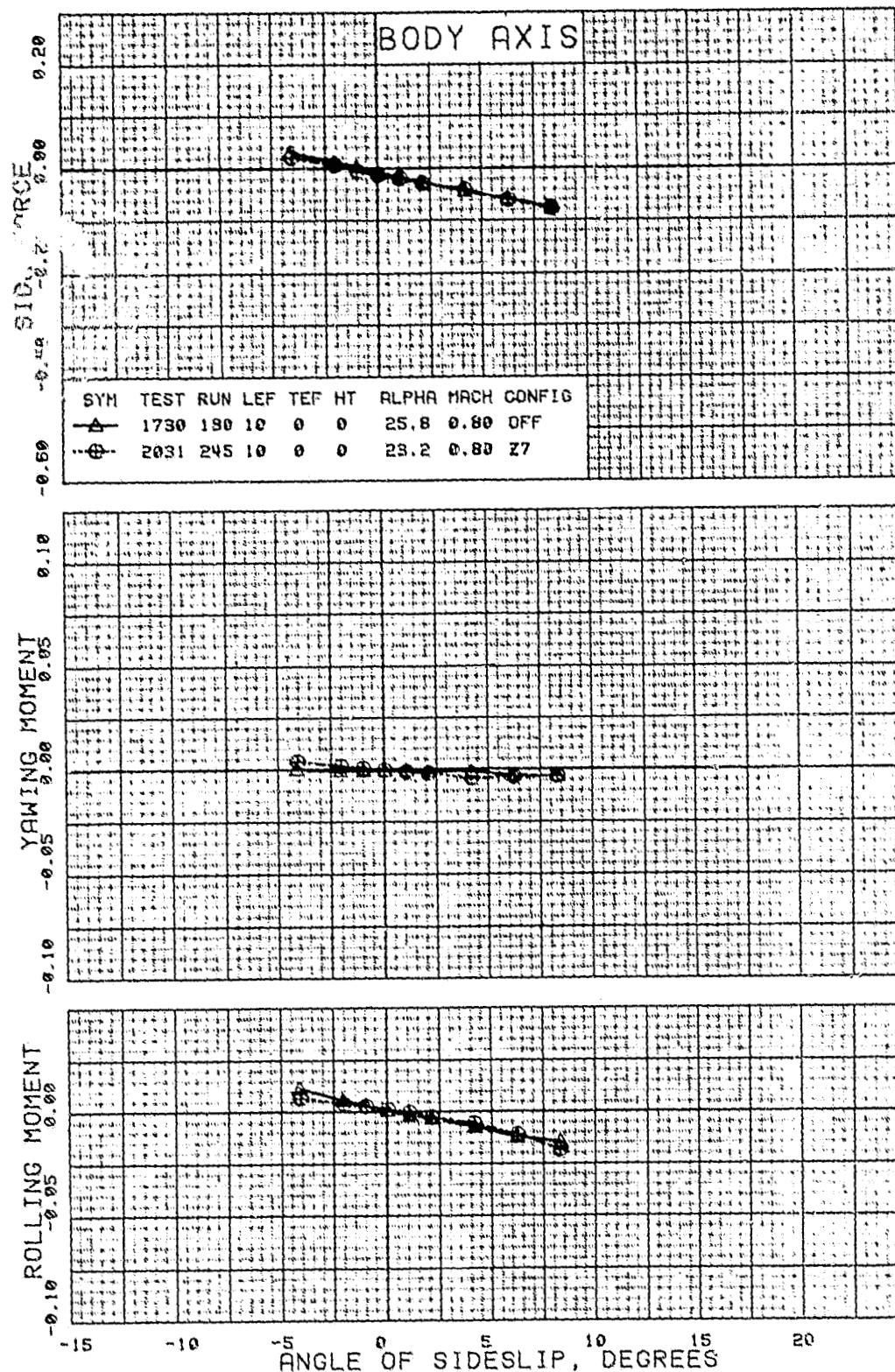
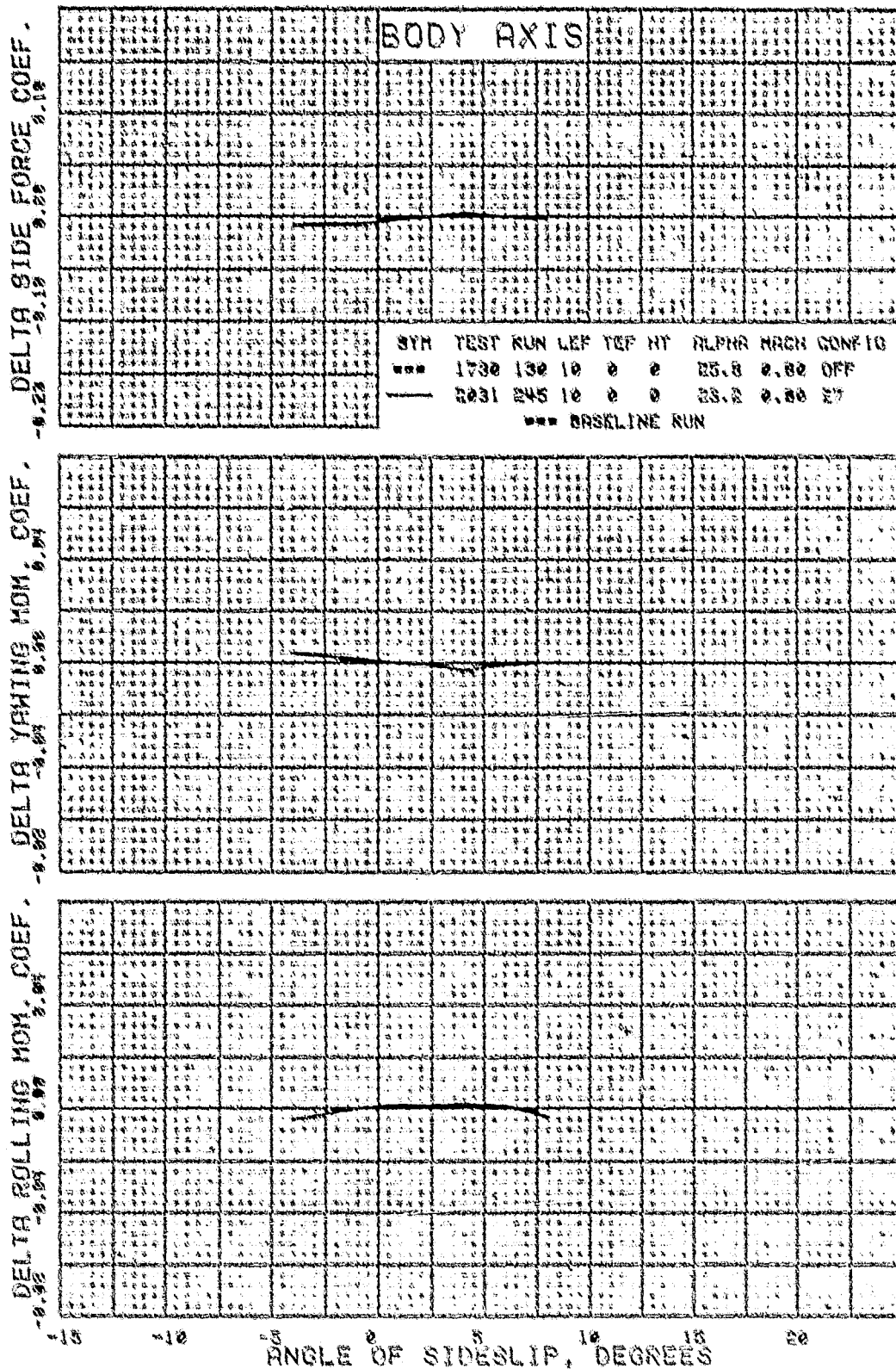


Figure 4-31 (c) Force and Moments, $\alpha = 25^\circ$



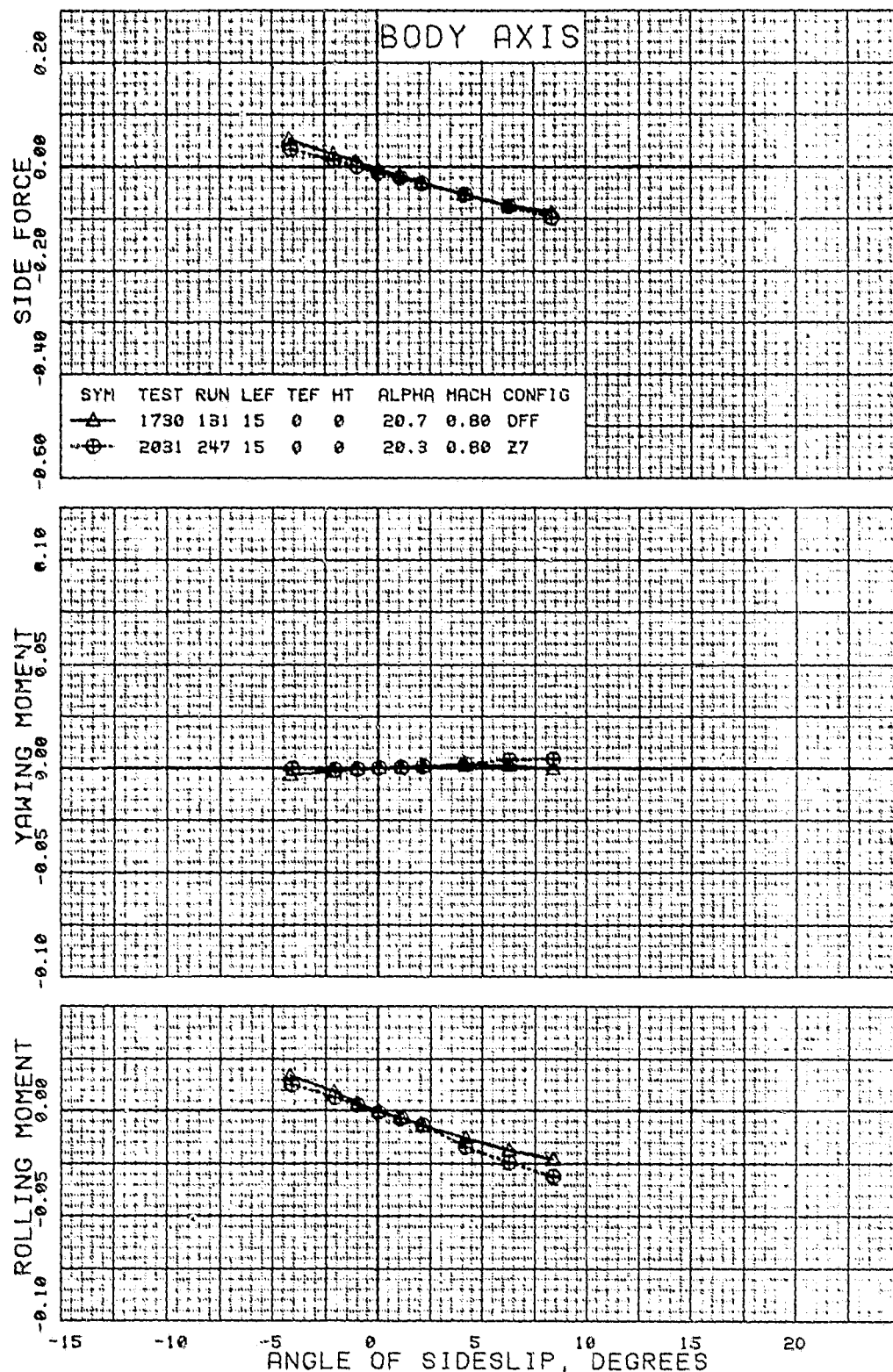


Figure 4-32 Effect of Forebody Strake Z7, Configuration 786, LEF = 15°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

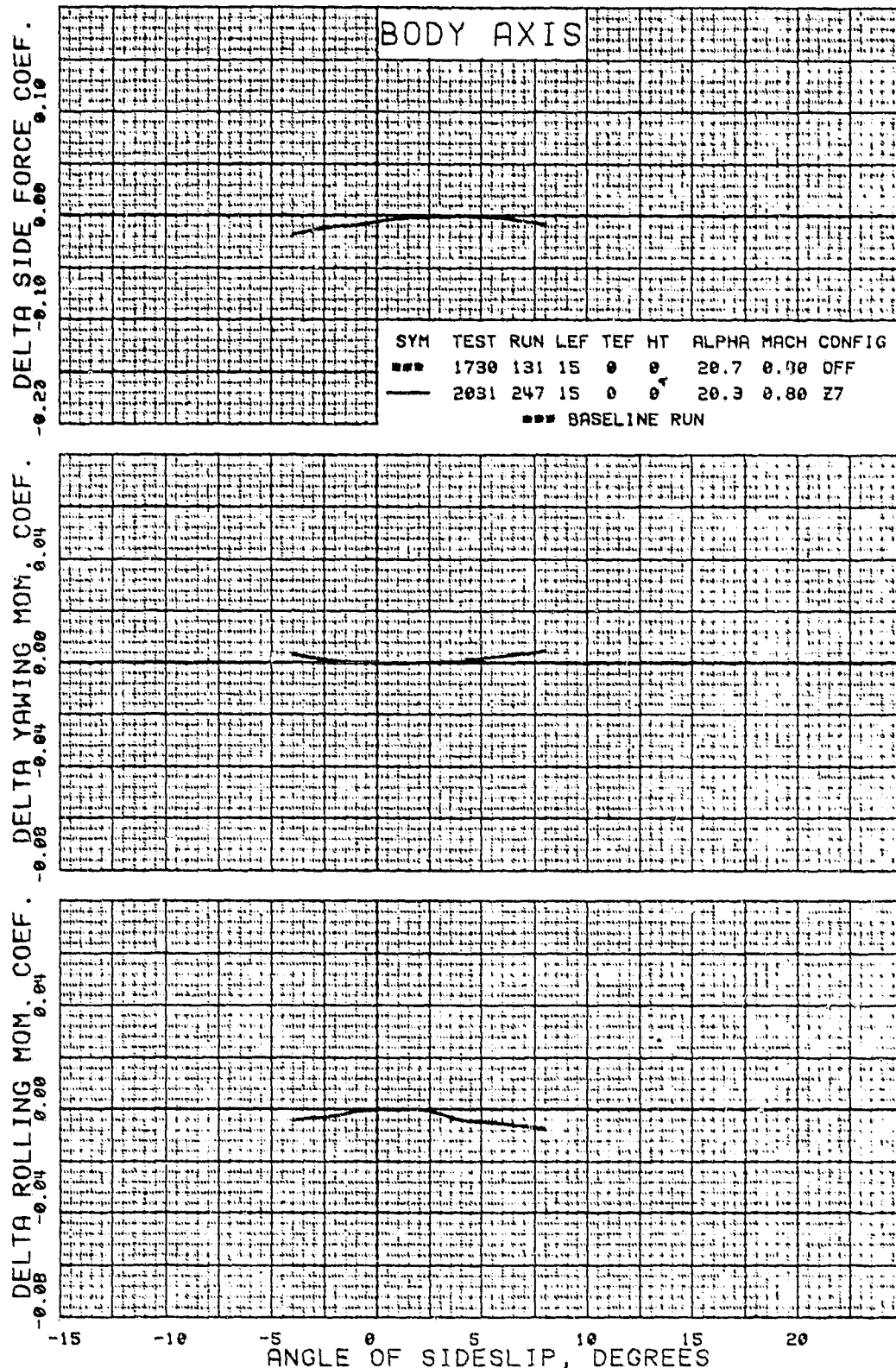


Figure 4-32 (b) Increments, $\alpha = 20^\circ$

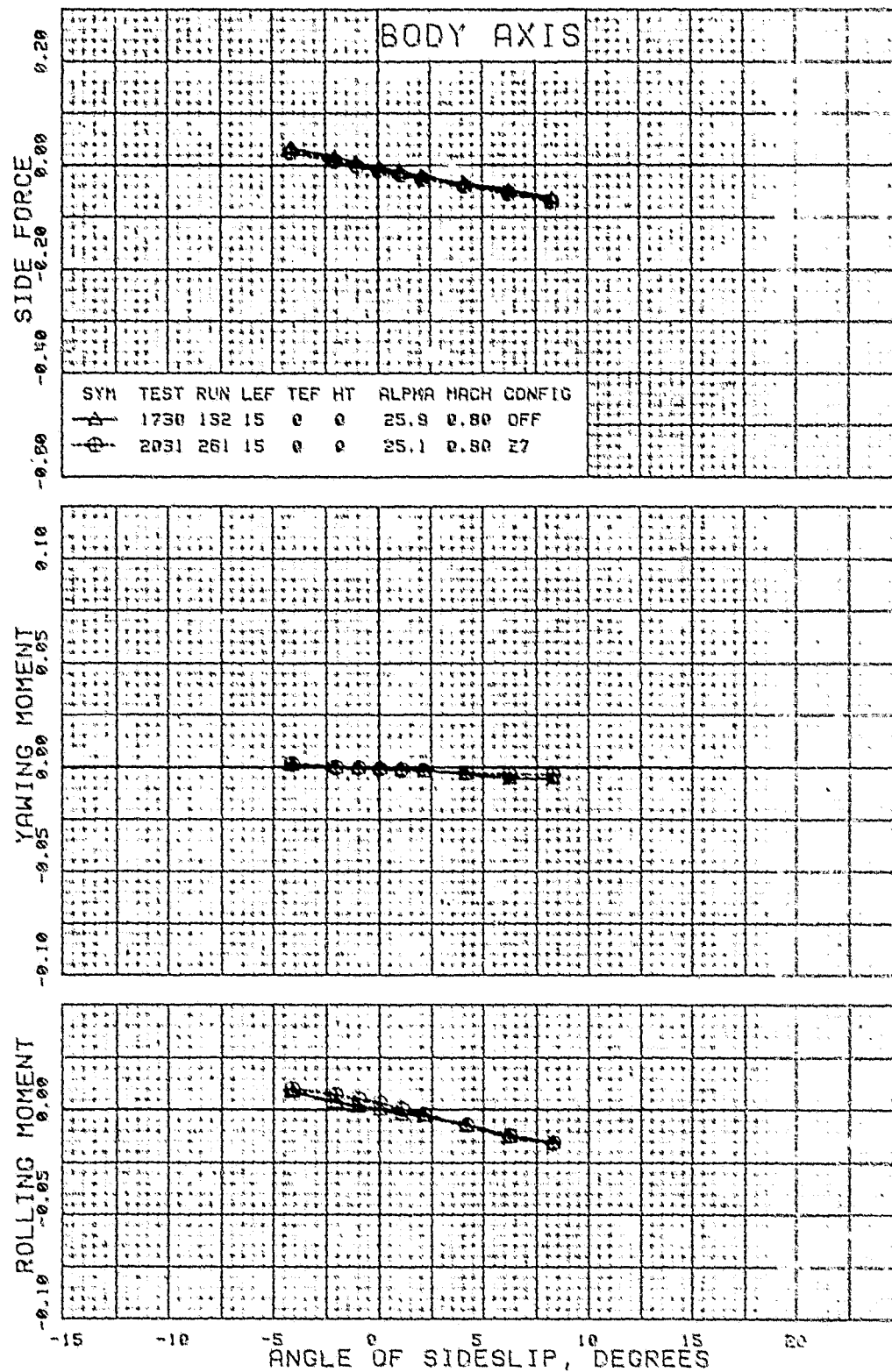


Figure 4-32 (c) Force and Moments, $\alpha = 25^\circ$

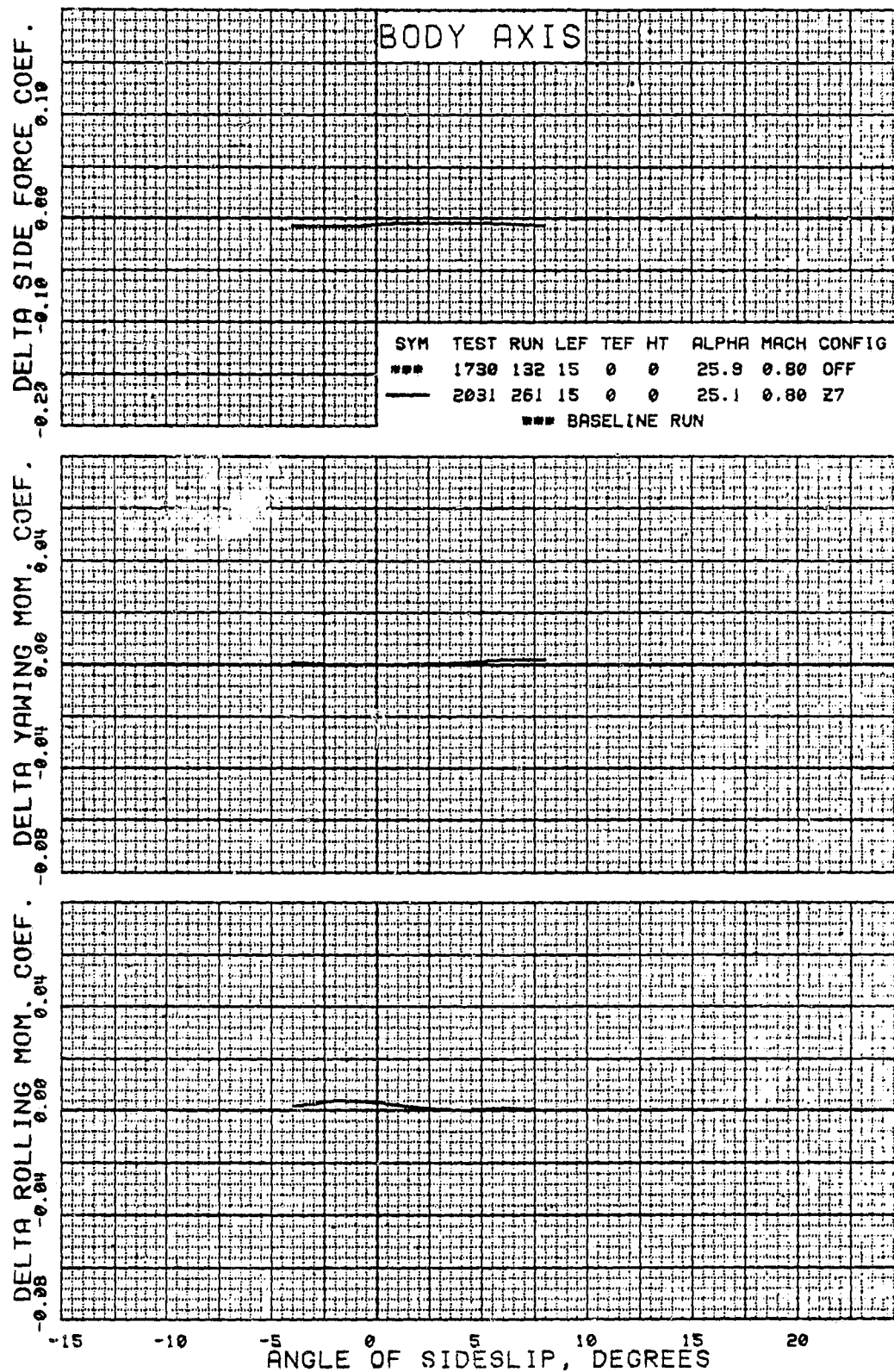


Figure 4-32 (d) Increments, $\alpha = 25^\circ$

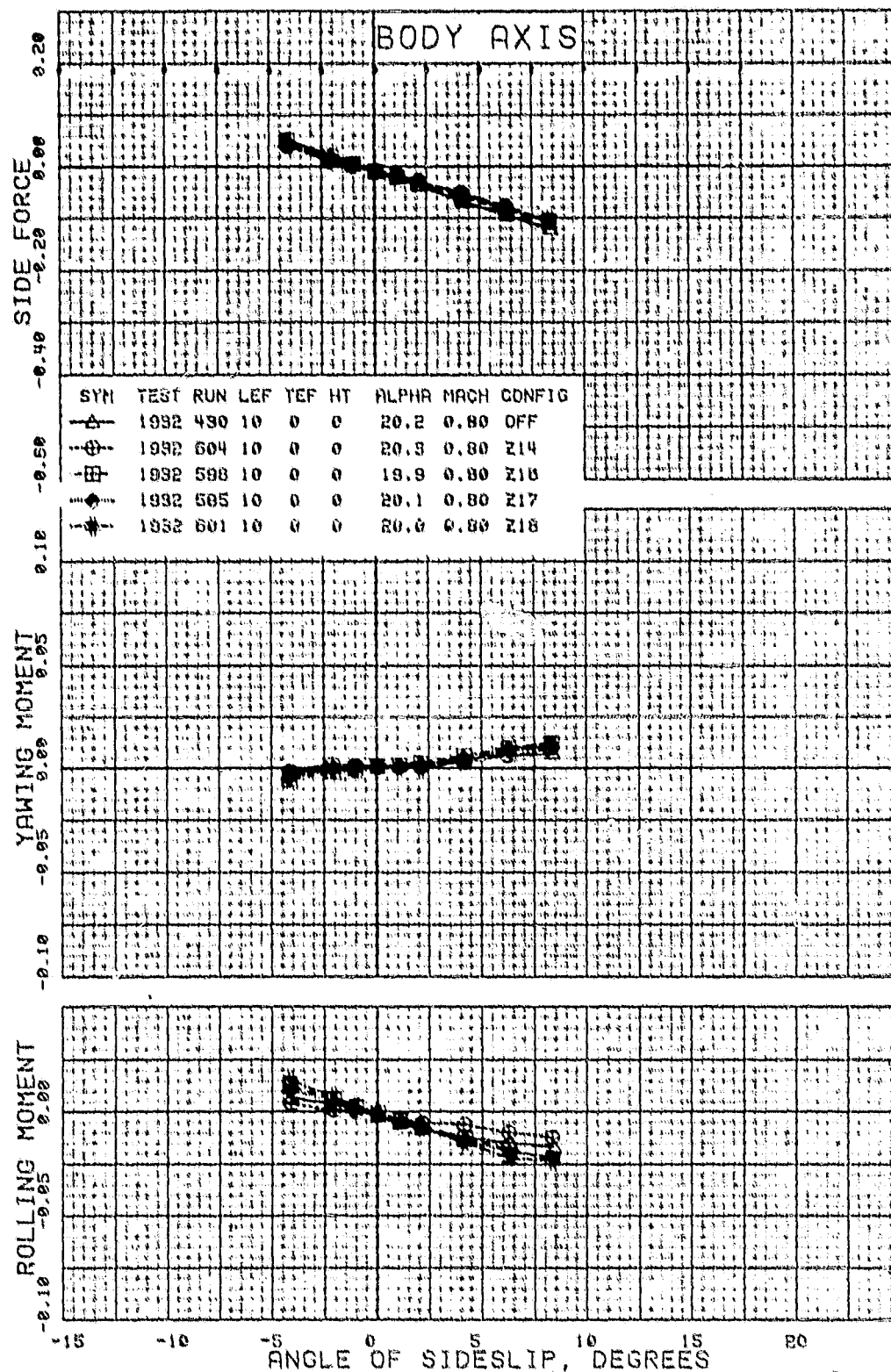


Figure 4-33 Effect of Ogee Planform Forebody Strakes (Z14, Z16, Z18), Configuration 401F-5, $M = 0.80$
(a) Force and Moments, $\alpha = 20^\circ$

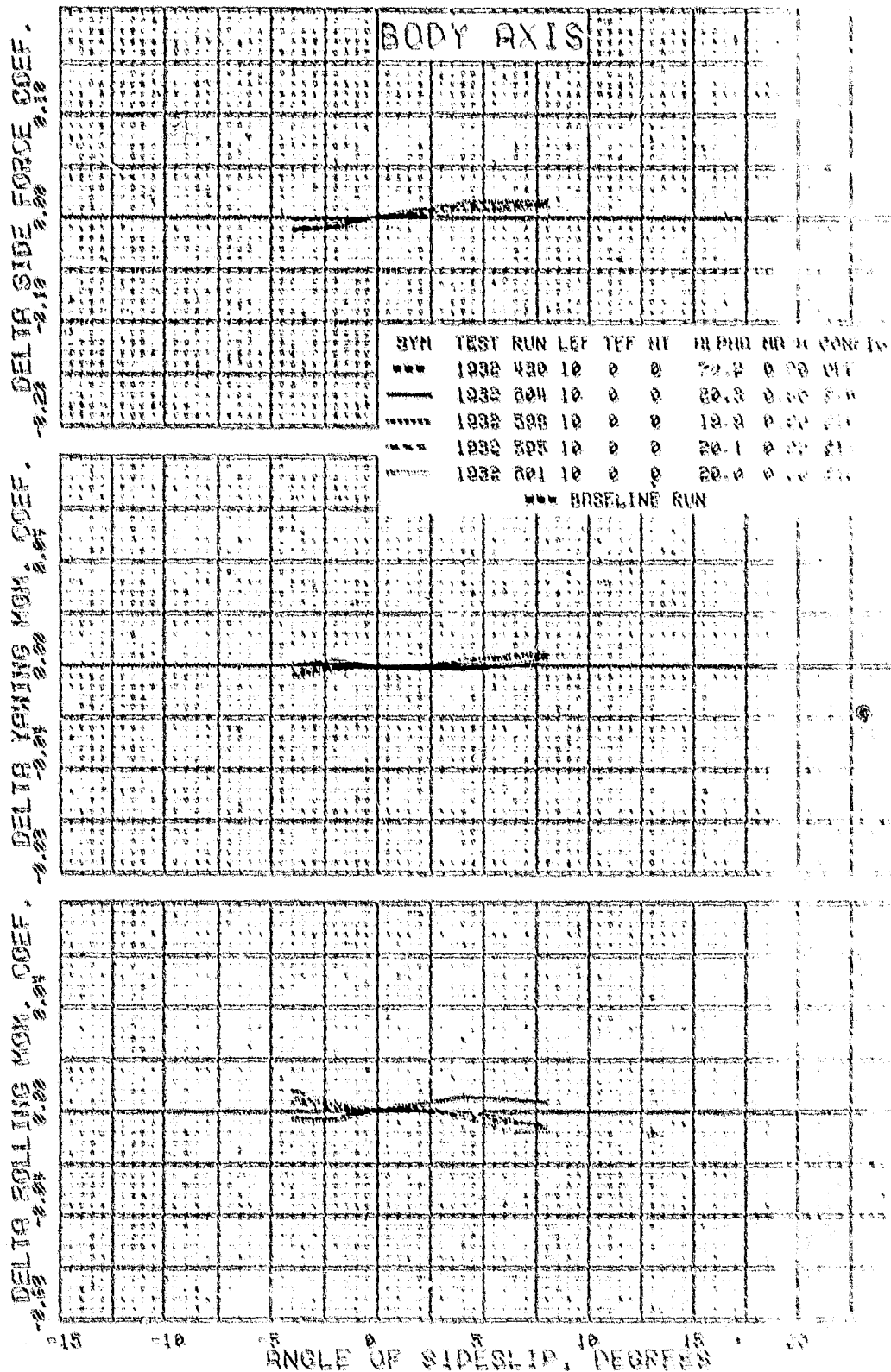


Figure 4-33 (b) Increments, $\alpha = 20^\circ$

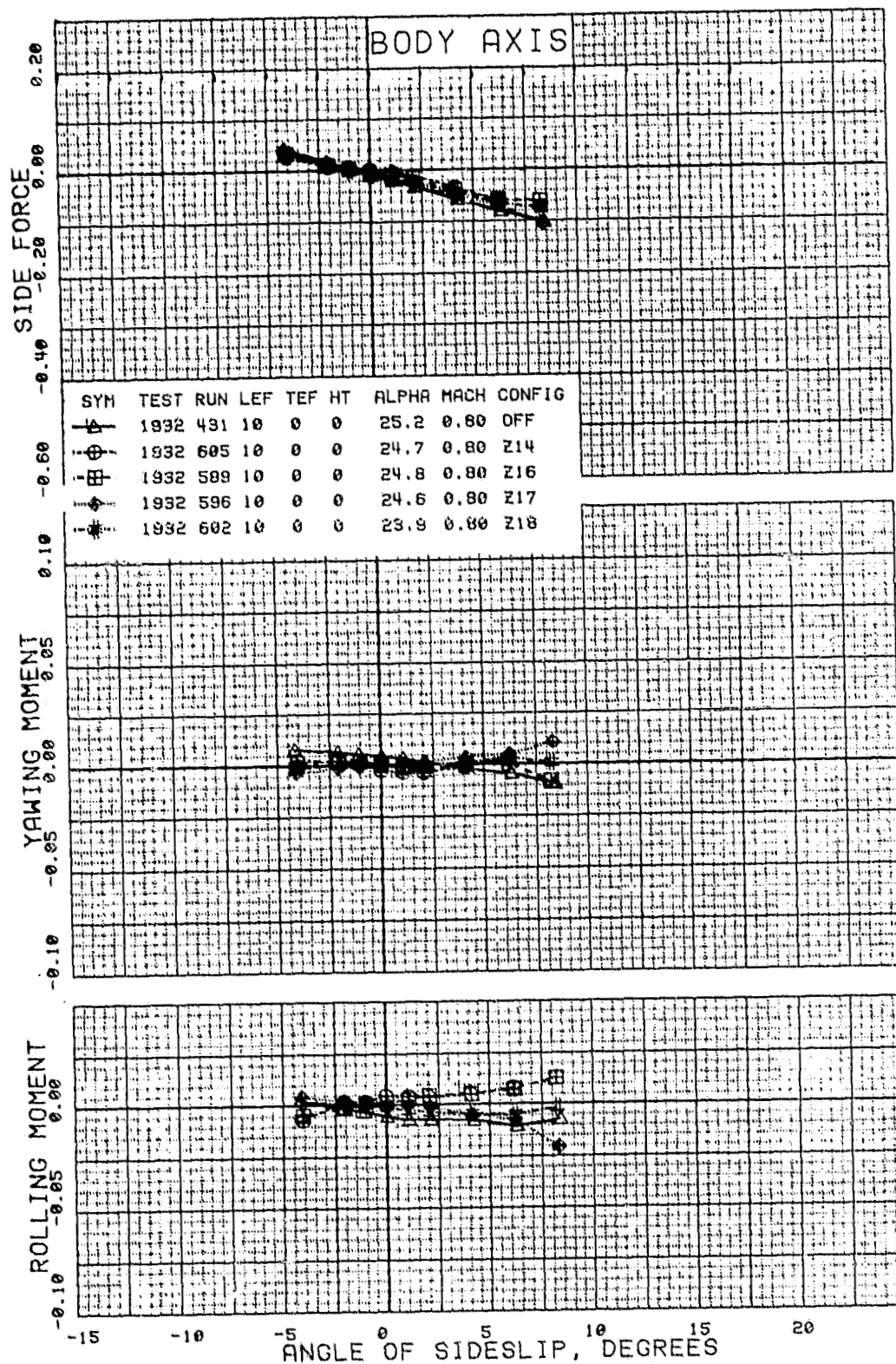


Figure 4-33 (c) Force and Moments, $\alpha = 25^\circ$

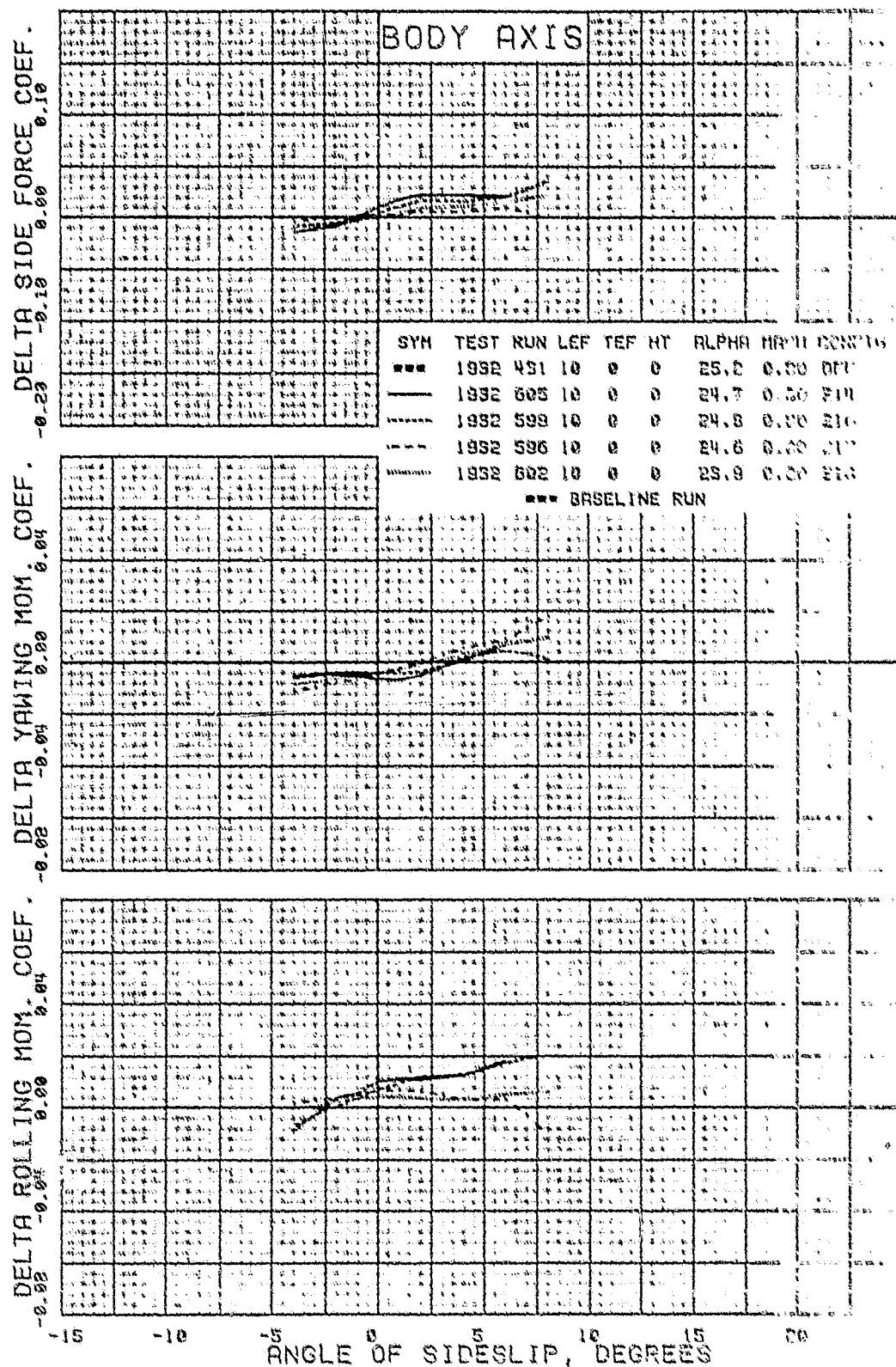


Figure 4-33 (d) Increments, $\alpha = 25^\circ$

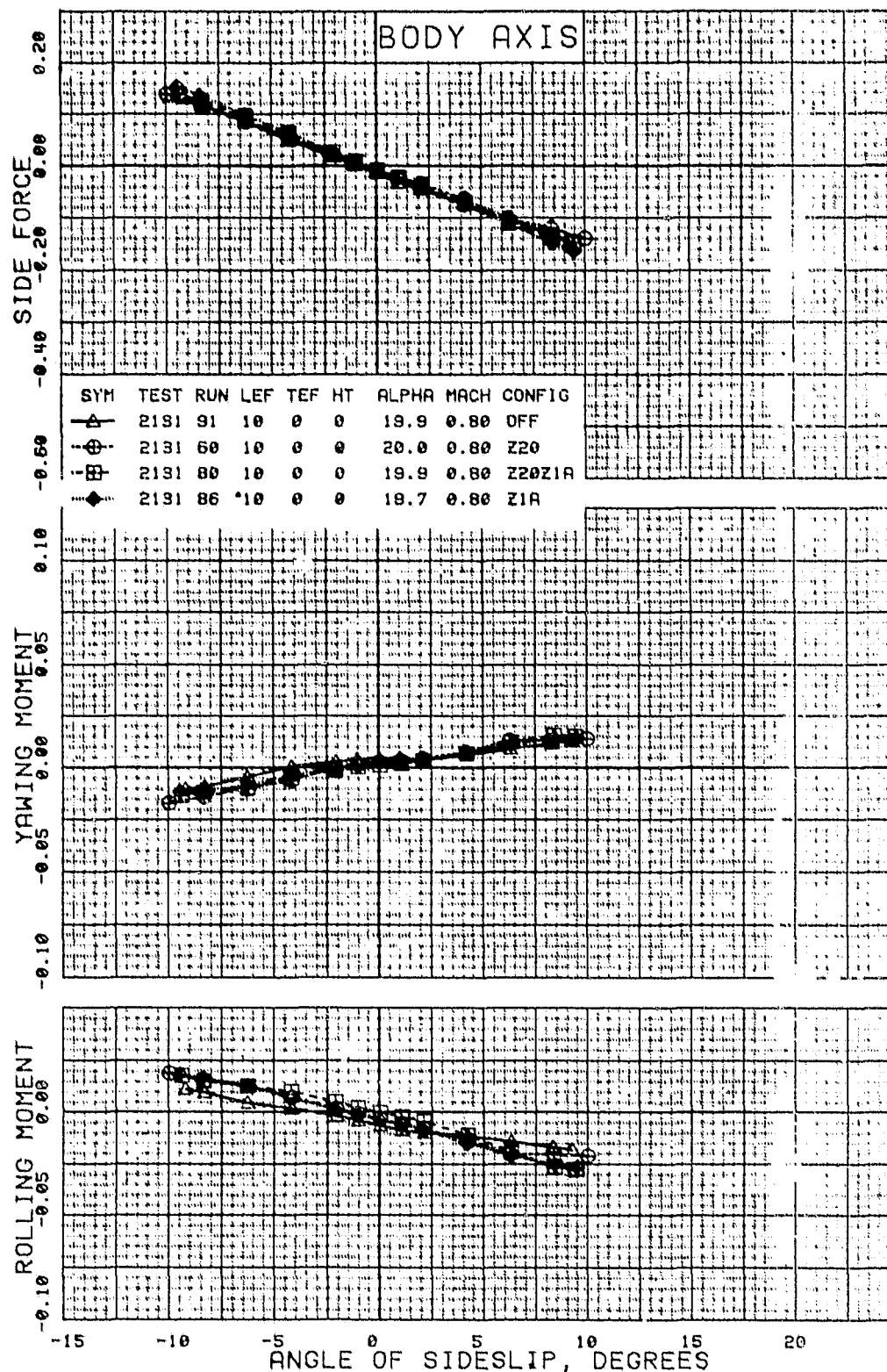


Figure 4-34 Effect of Forebody Chines (Z20, Z21) and Canard Strake Z1A, Configuration 401F-10A, LEF = 10°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

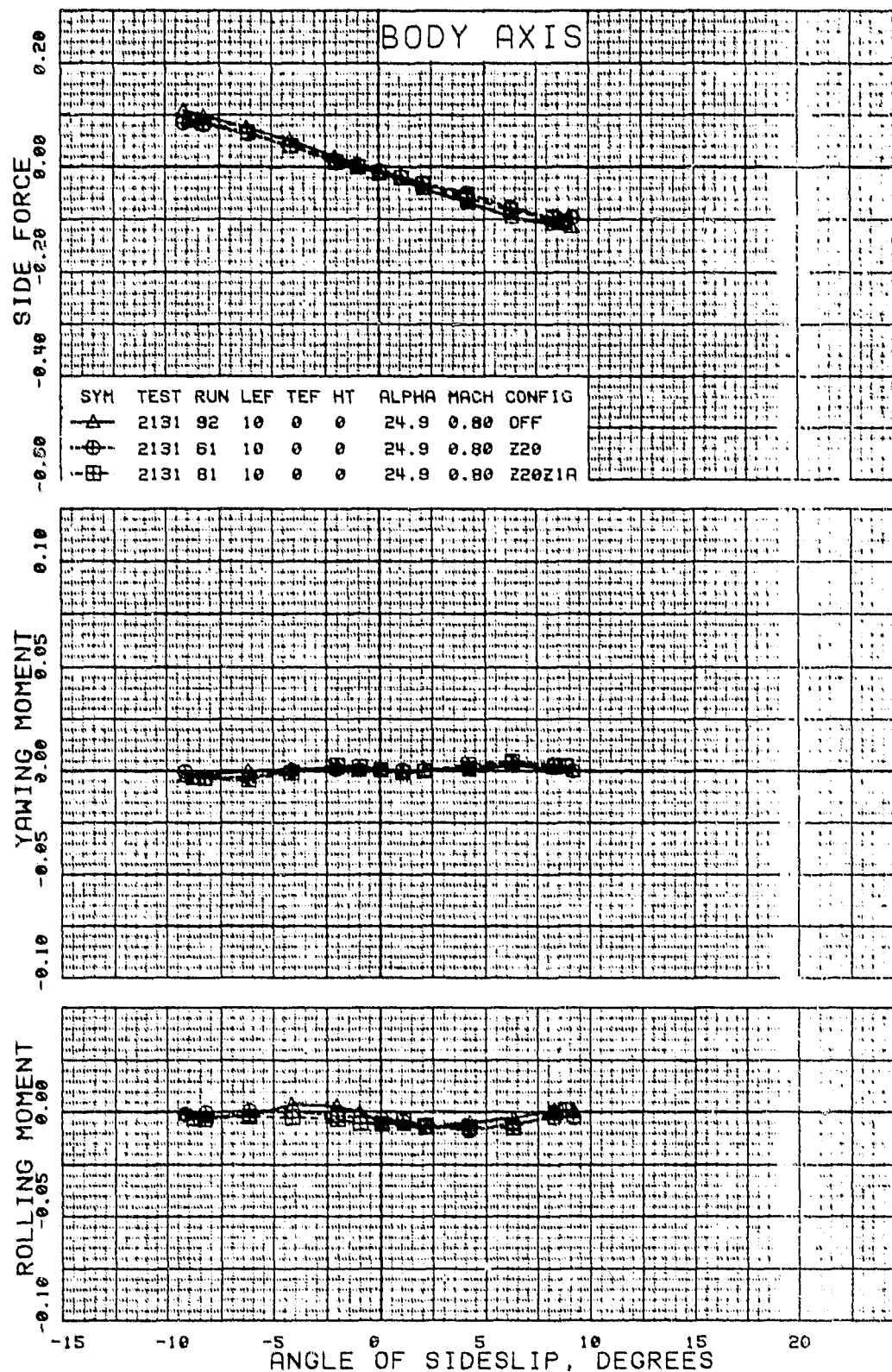


Figure 4-34 (b) Force and Moments, $\alpha = 25^\circ$

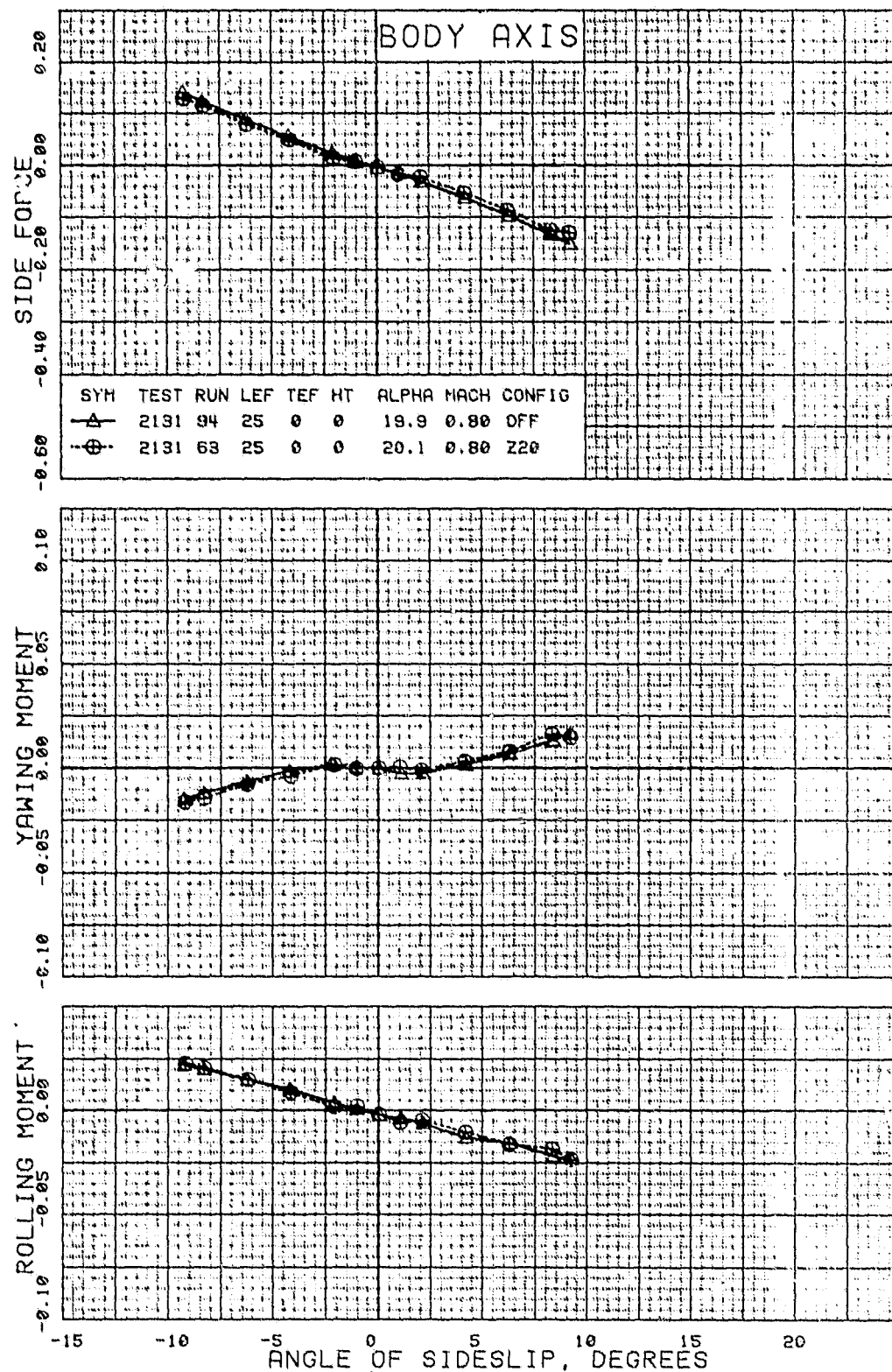


Figure 4-35 Effect of Forebody Chine Z20, Configuration 401F-10A, LEF = 25°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

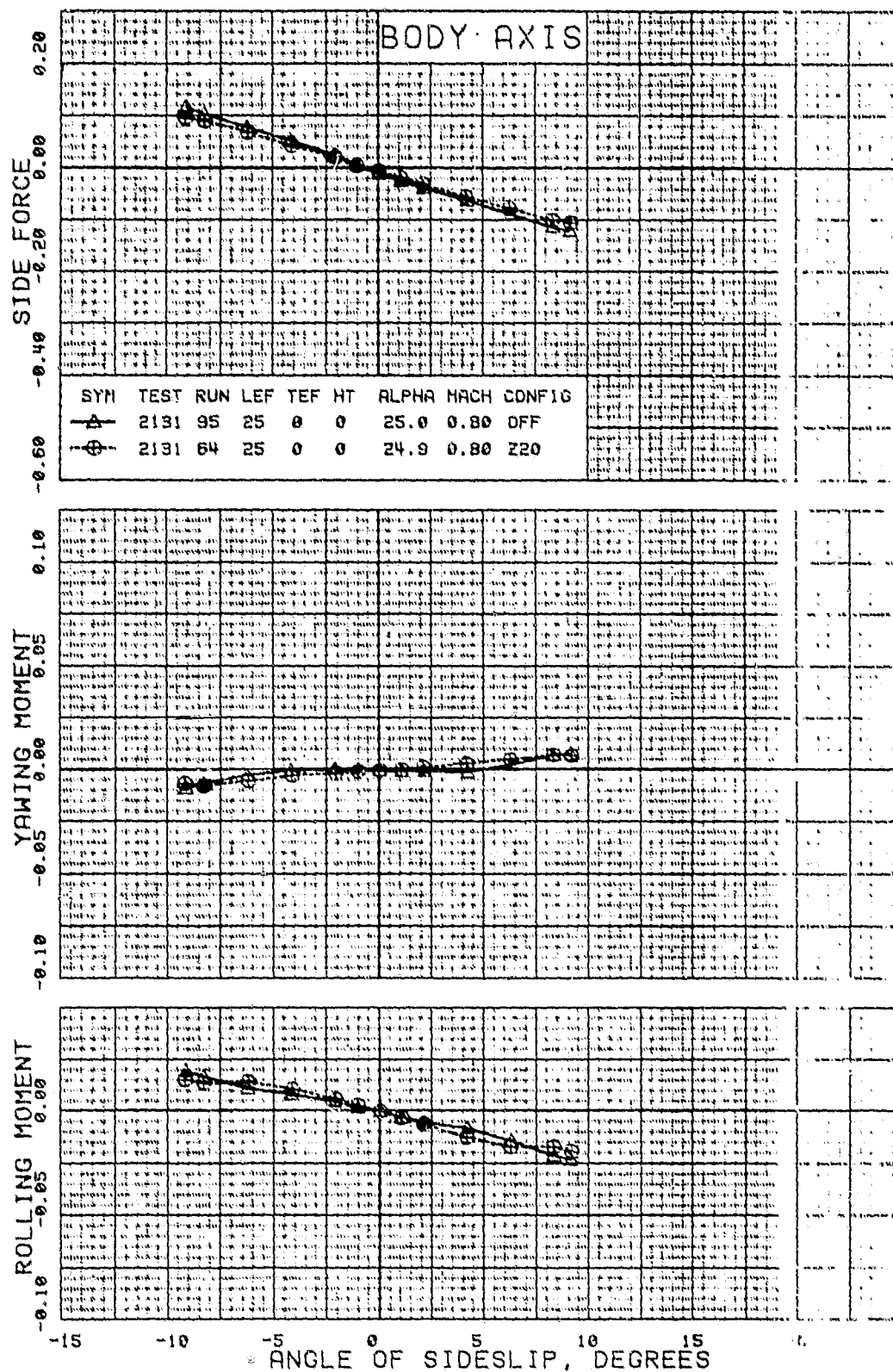


Figure 4-35 (b) Force and Moments, $\alpha = 25^\circ$

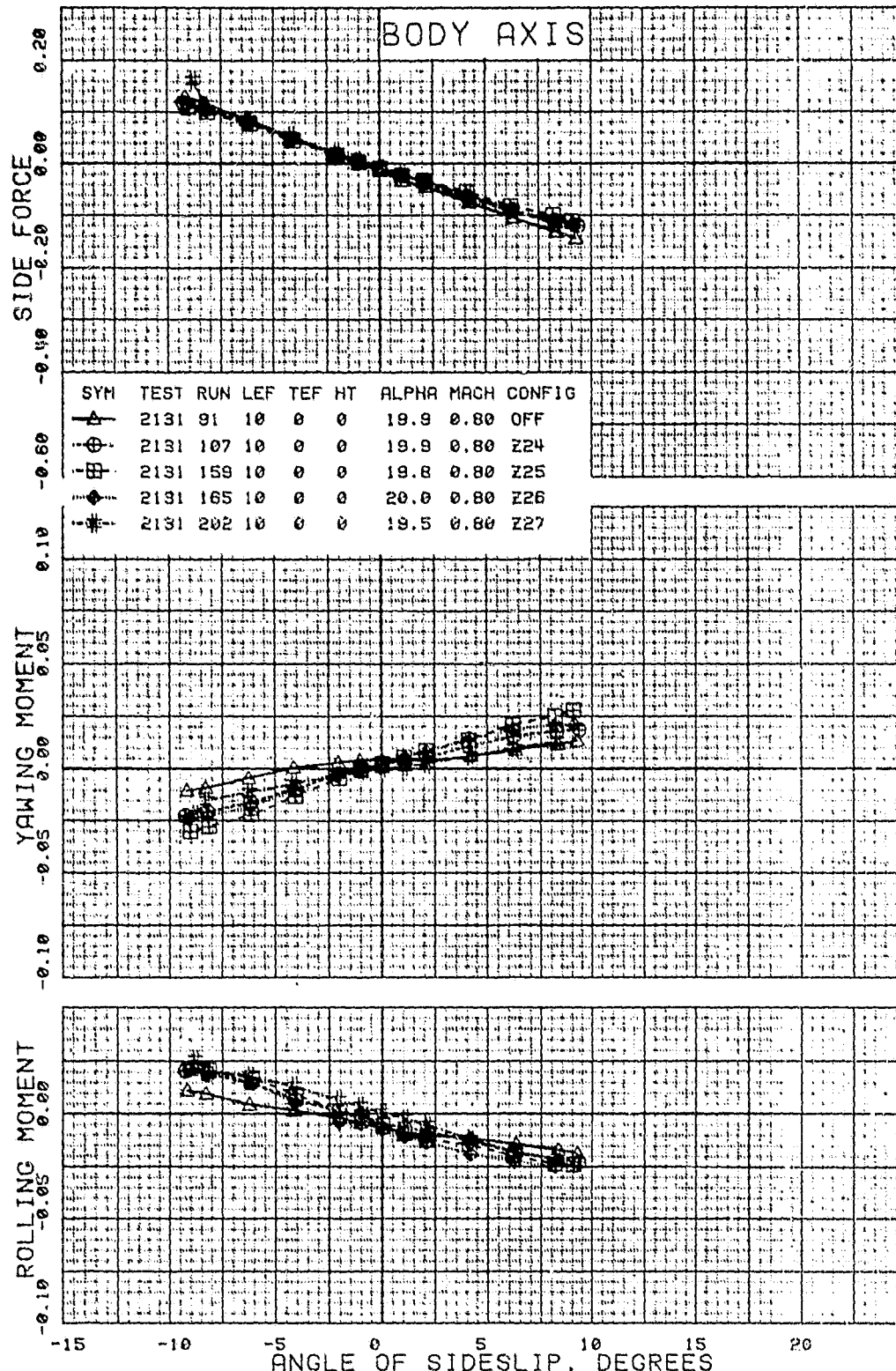


Figure 4-36 Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 10°, M = 0.80
 (a) Force and Moments, $\alpha = 20^\circ$

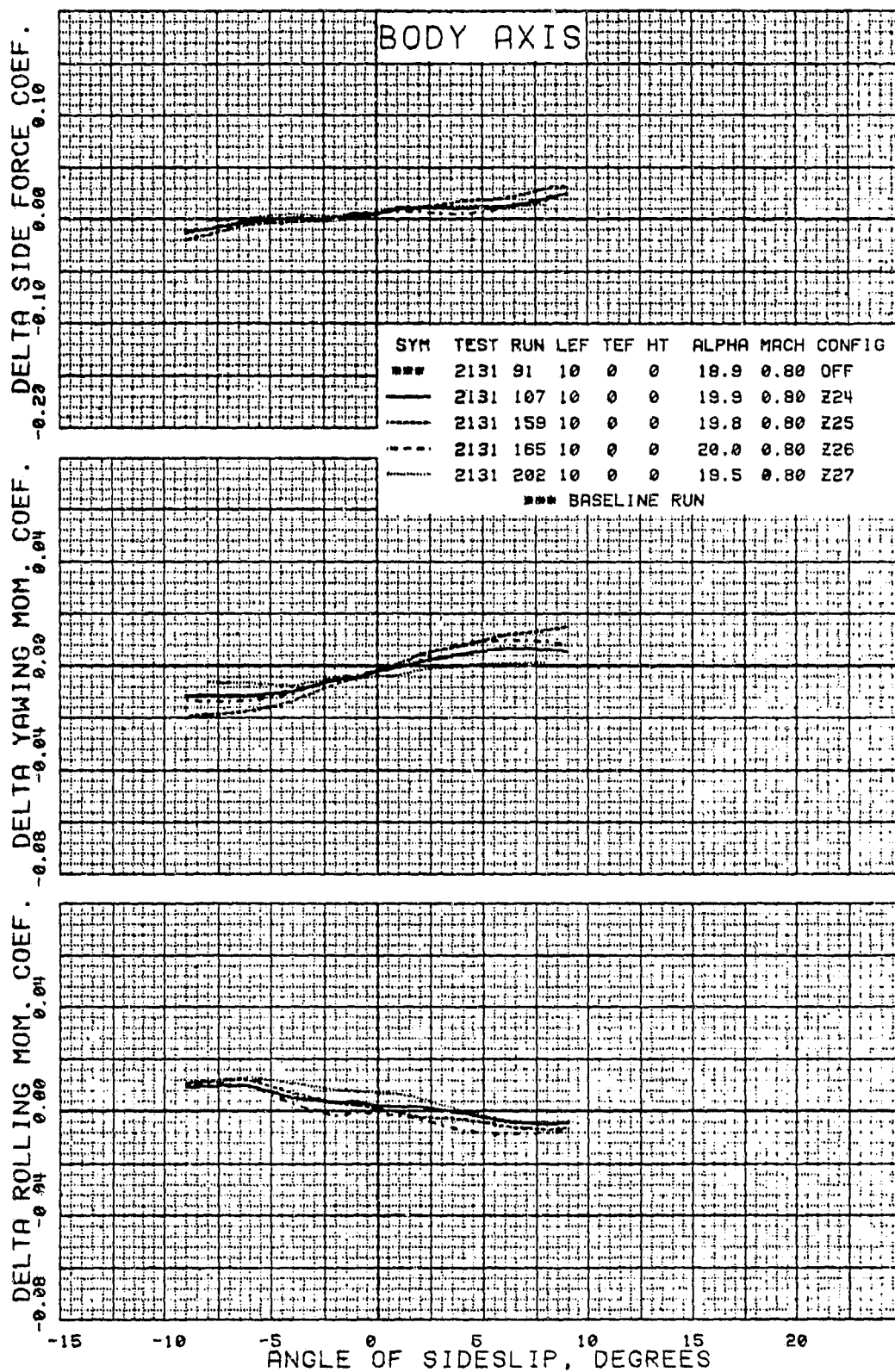


Figure 4-36 (b) Increments, $\alpha = 20^\circ$

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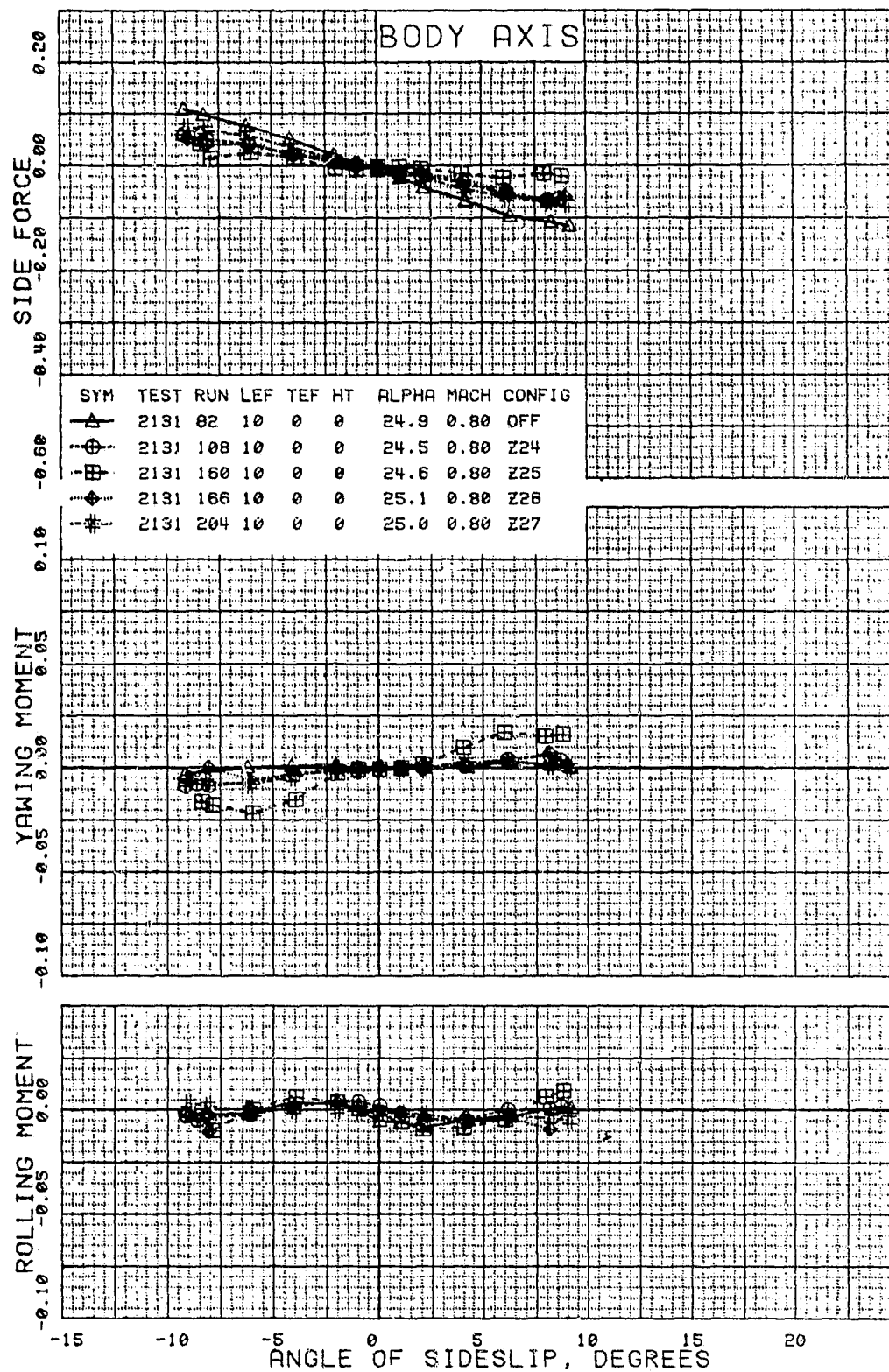


Figure 4-36 (c) Force and Moments, $\alpha = 25^\circ$

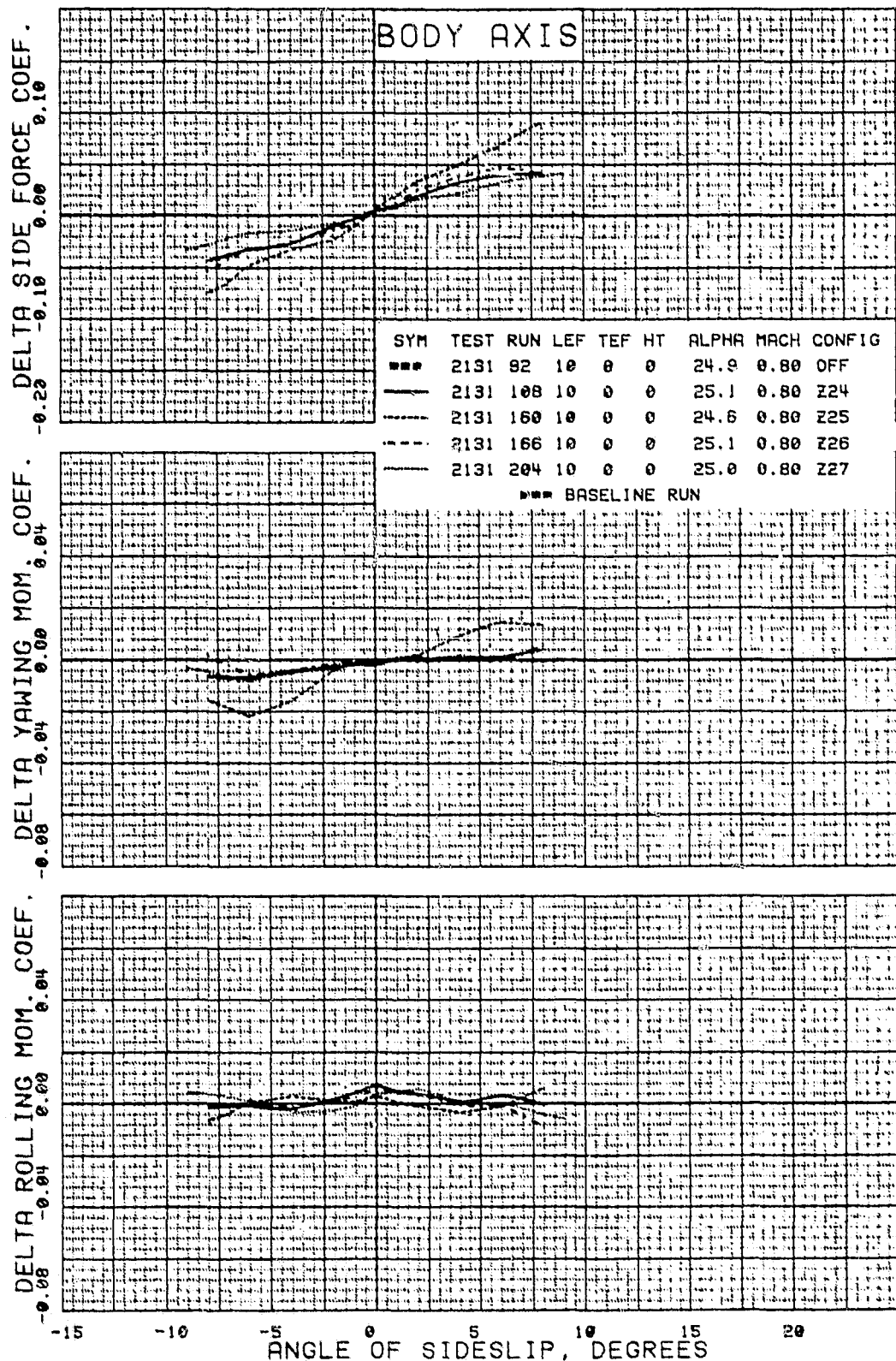


Figure 4-36 (d) Increments, $\alpha = 25^\circ$

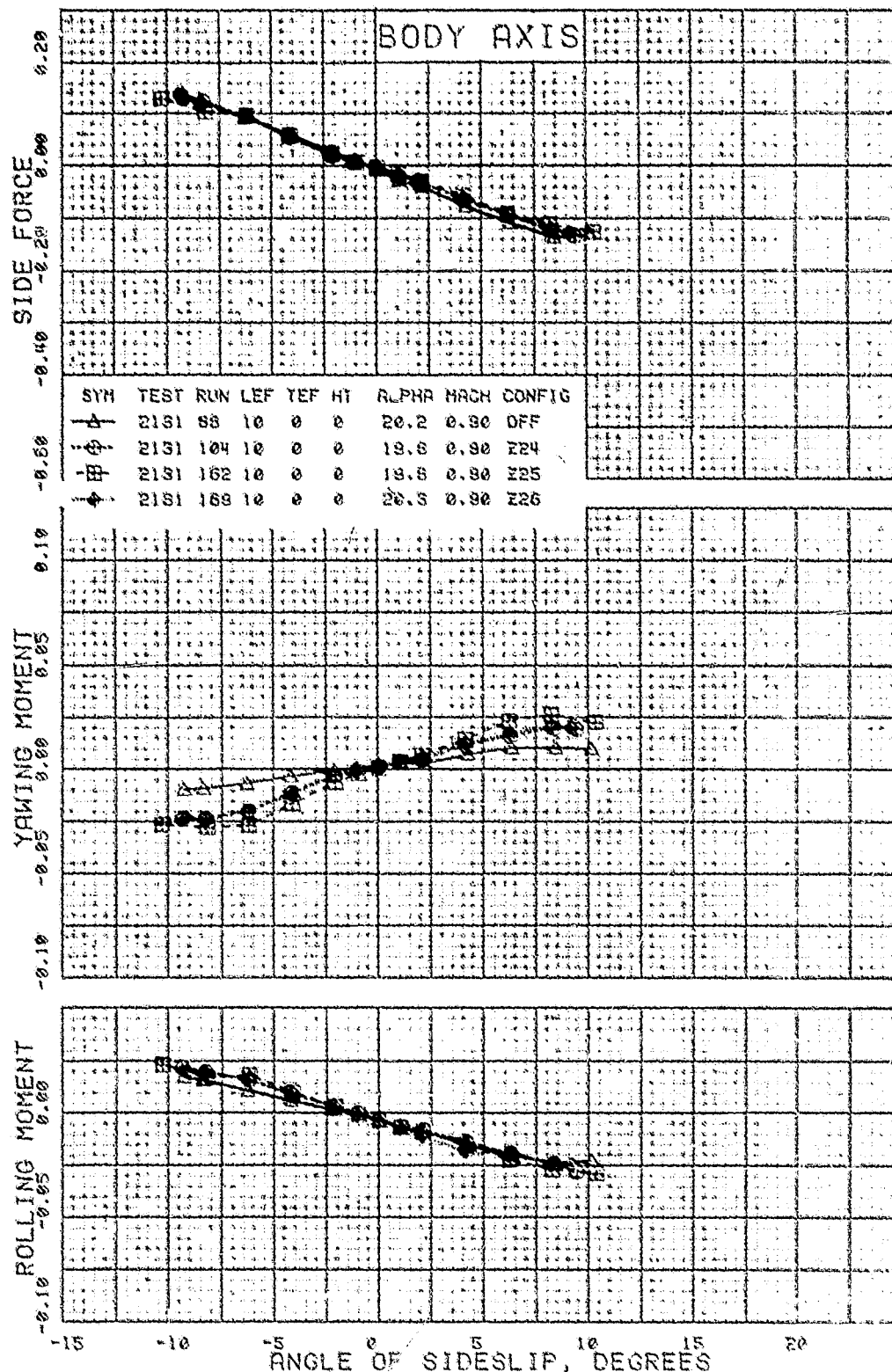


Figure 4-37 Effect of Forebody Strake Shape (Z24-Z26), Configuration 401F-10A, $M = 0.90$
(a) Force and Moments, $\alpha = 20^\circ$

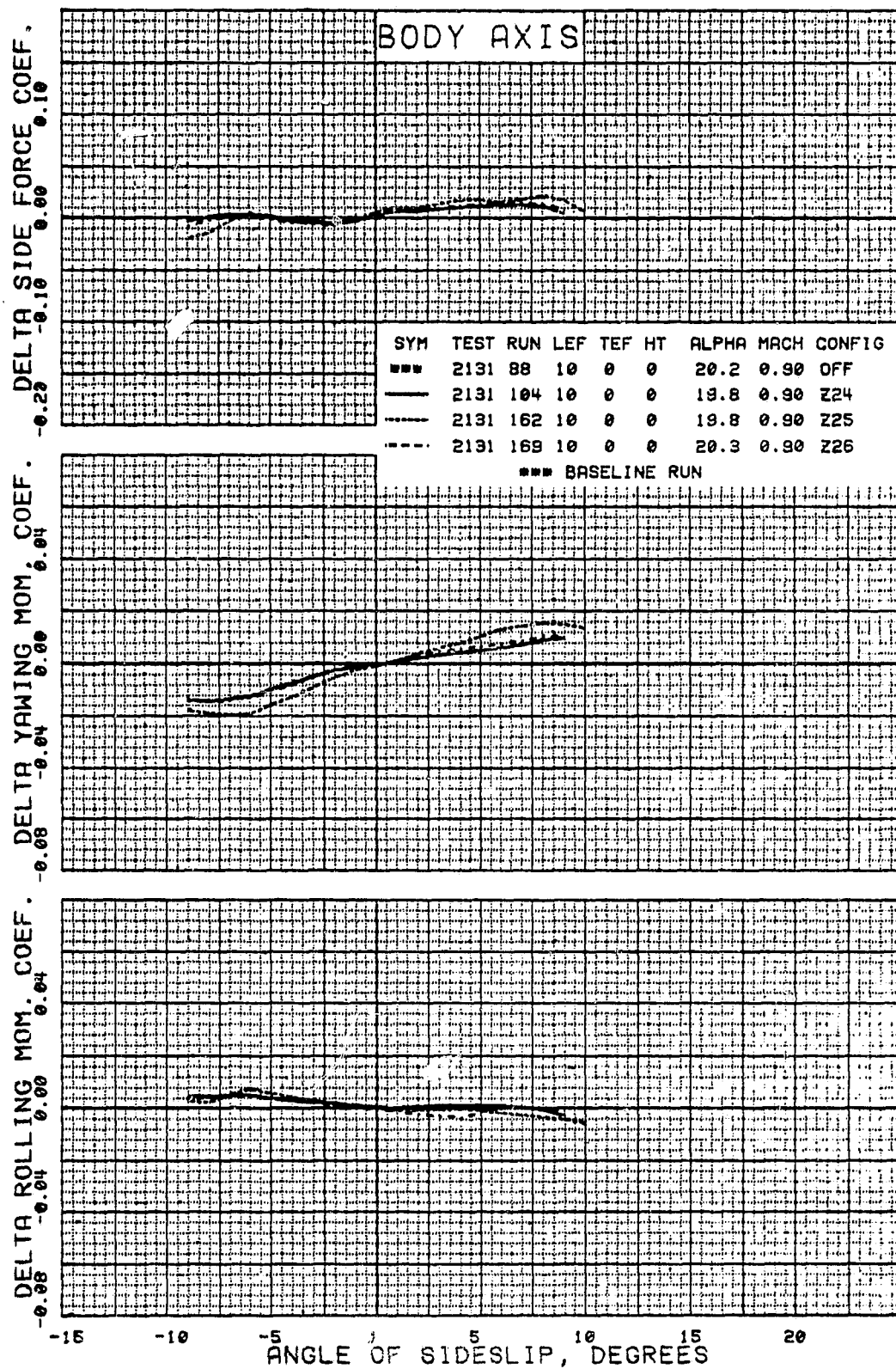


Figure 4-37 (b) Increments, $\alpha = 20^\circ$

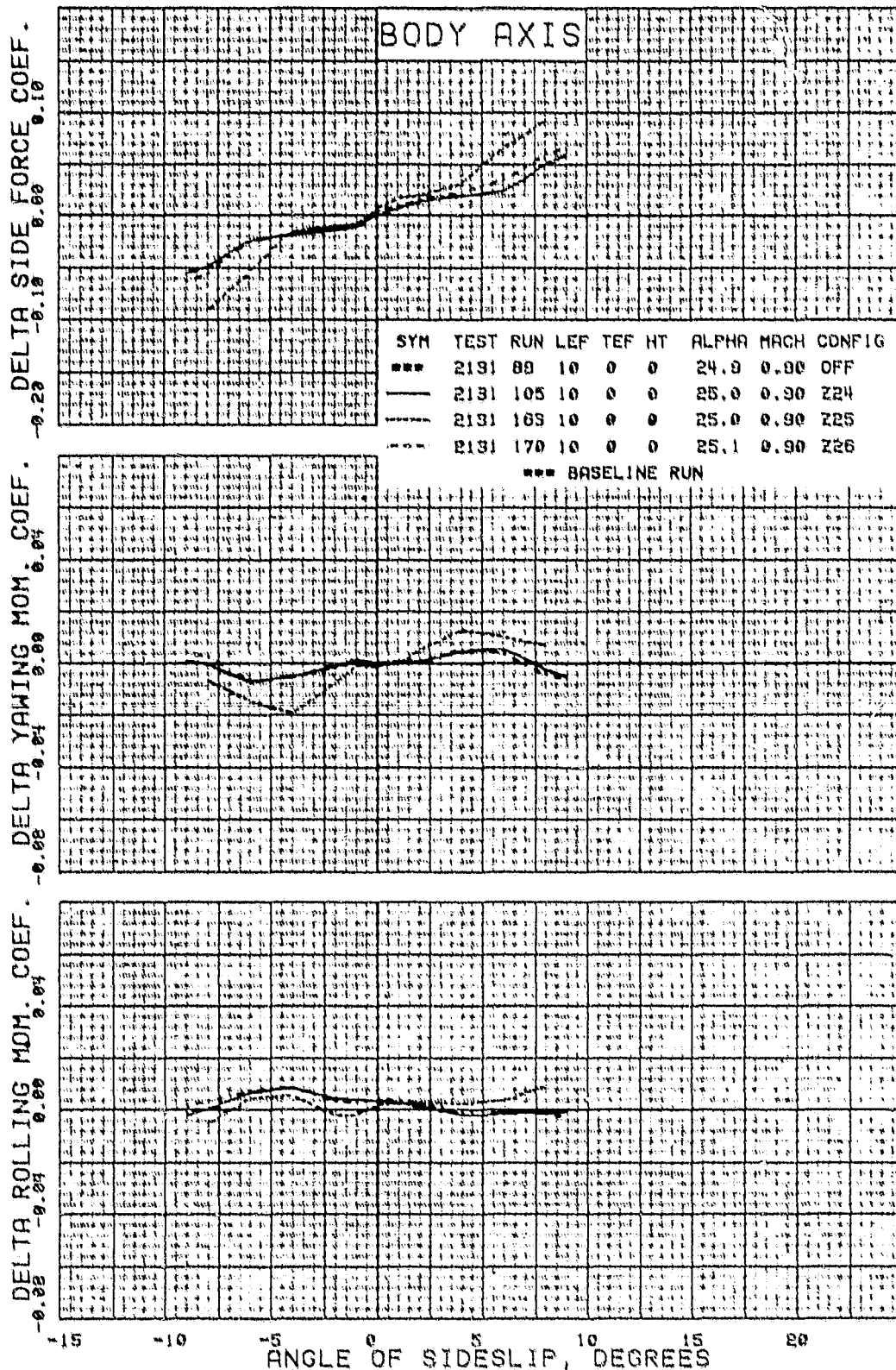


Figure 4-37 (d) Increments, $\alpha = 25^\circ$

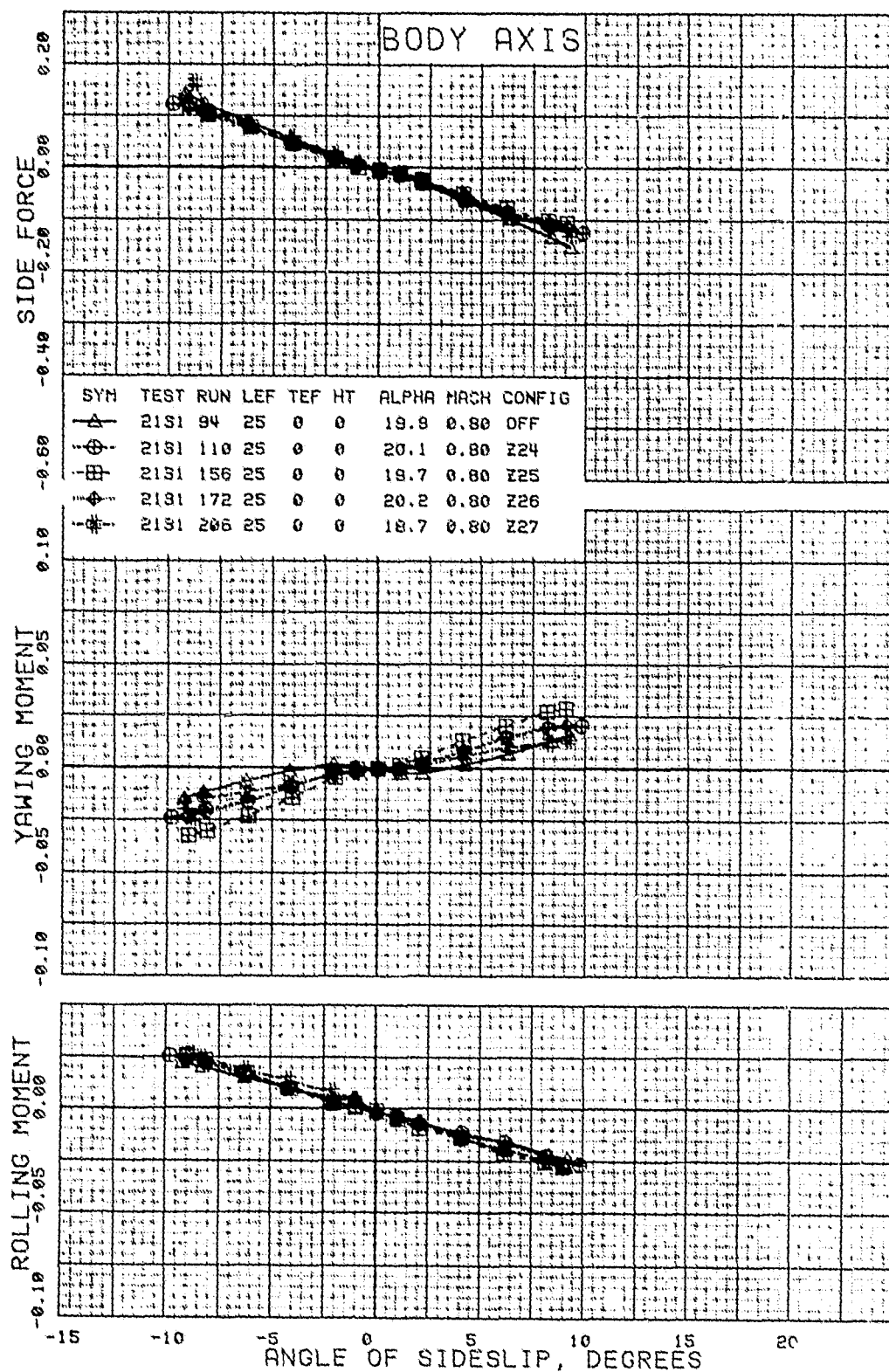


Figure 4-38 Effect of Forebody Strake Shape (Z24-Z27), Configuration 401F-10A, LEF = 25°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

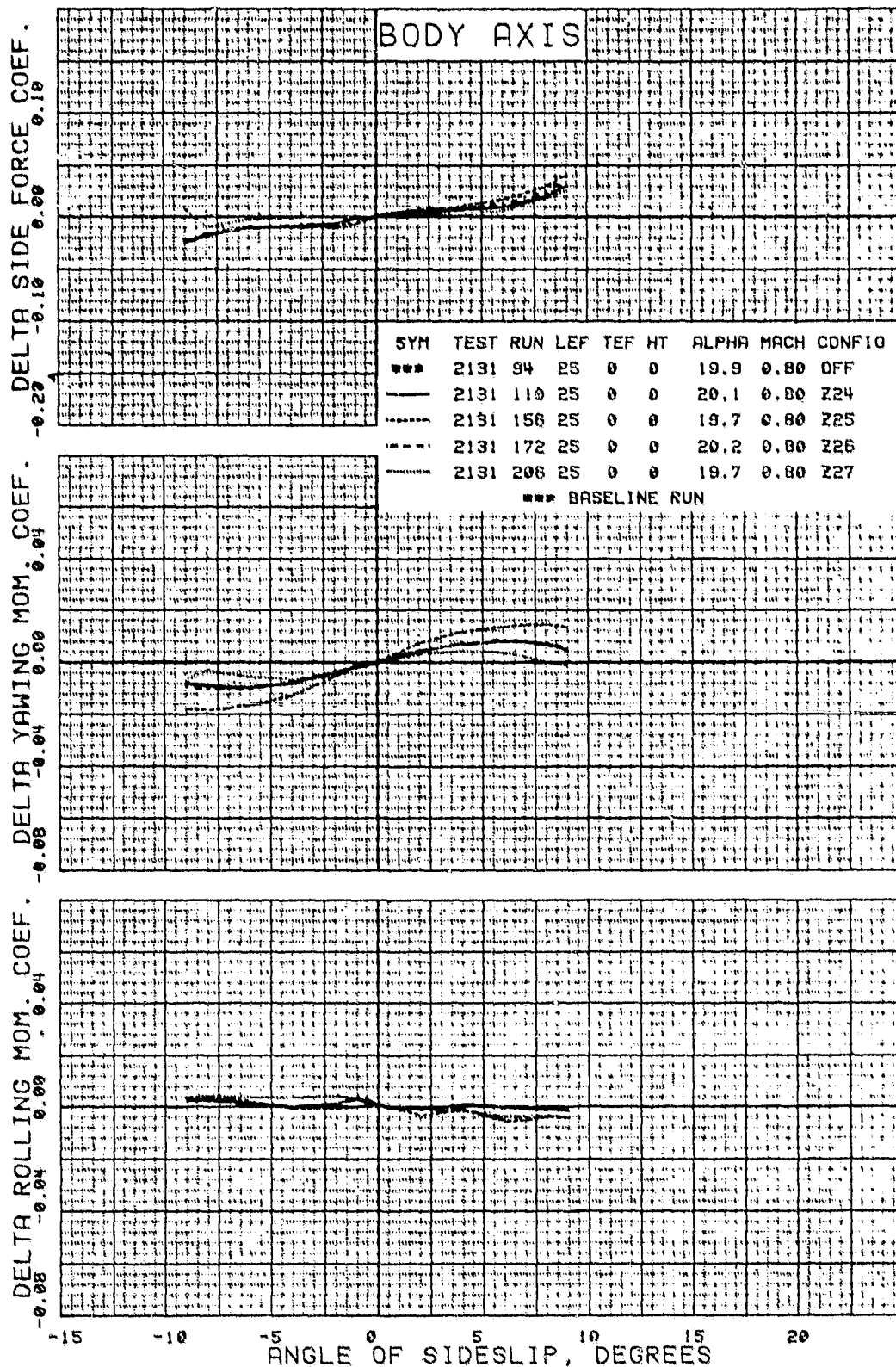


Figure 4-38 (b) Increments, $\alpha = 20^\circ$

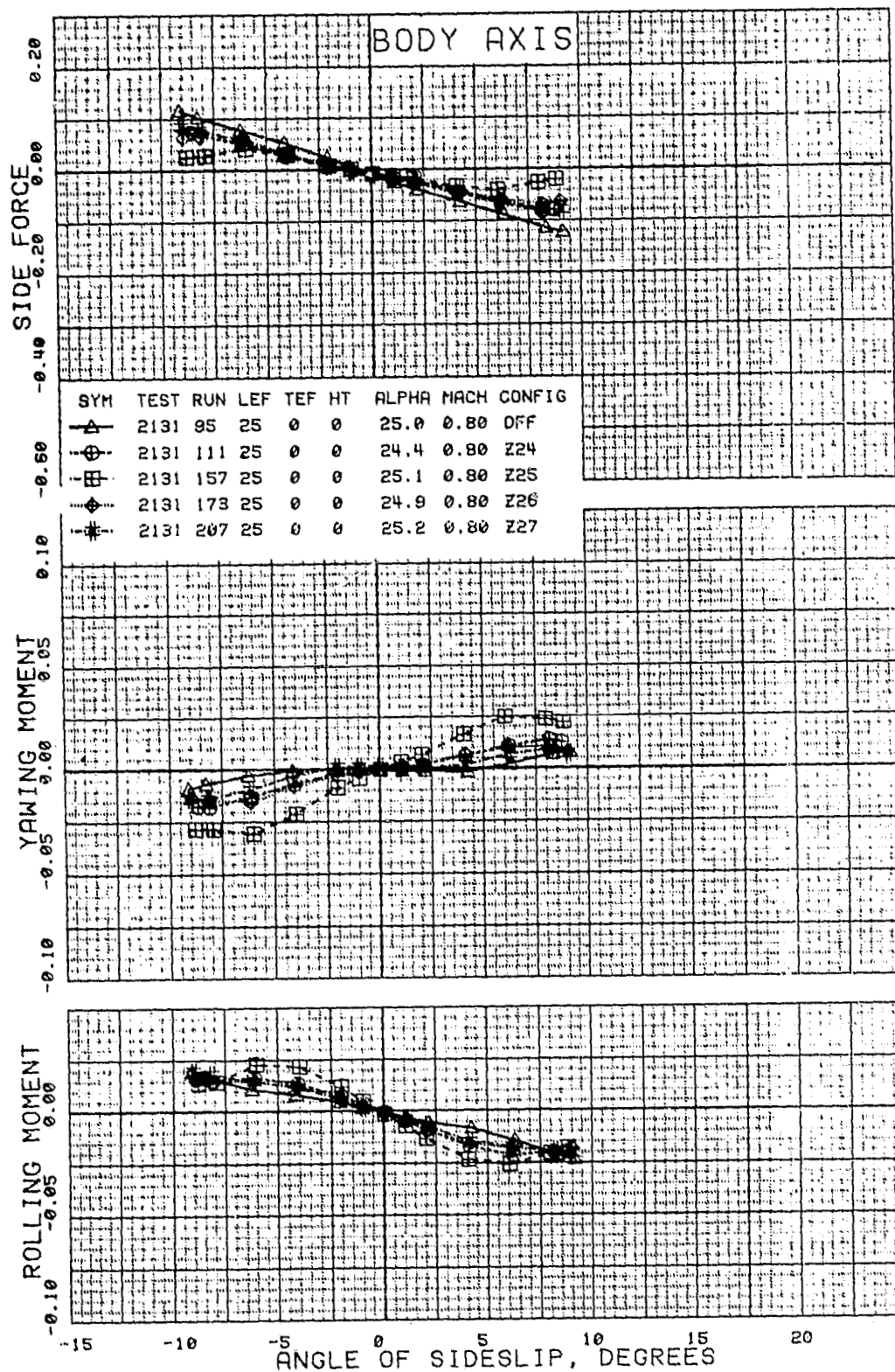
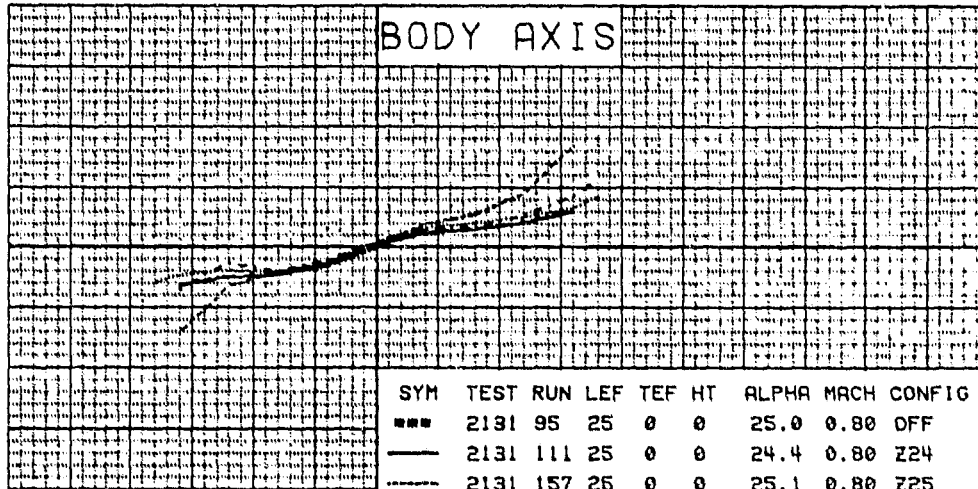
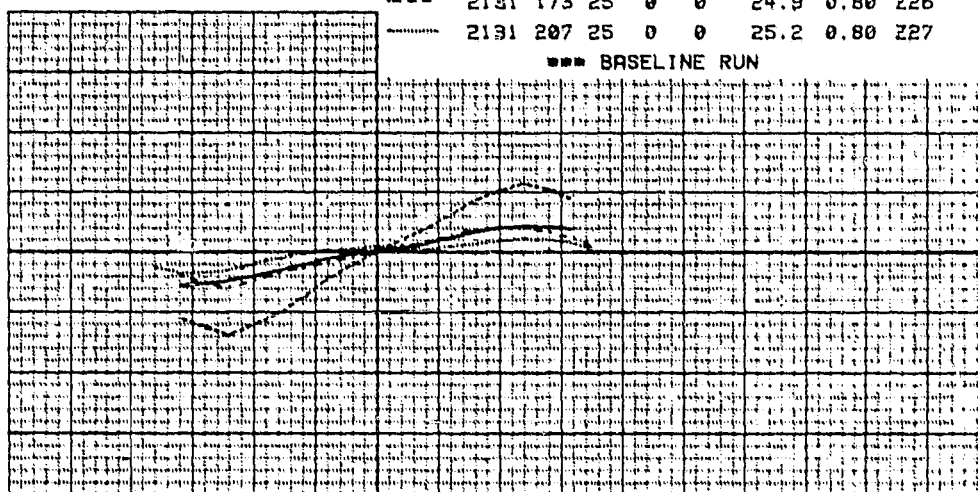


Figure 4-38 (c) Force and Moments, $\alpha = 25^\circ$

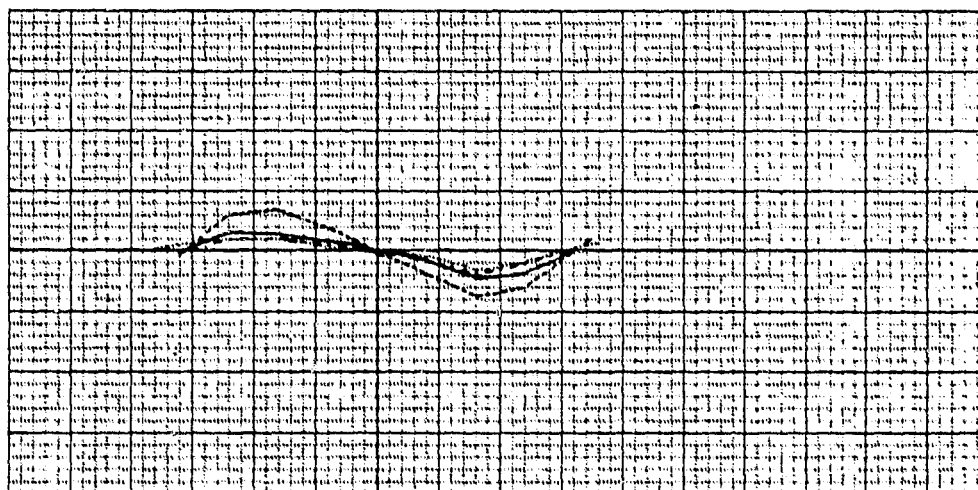
DELTA SIDE FORCE COEF.
-0.29 -0.10 0.00 0.10



DELTA YAWING MOM. COEF.
-0.08 -0.04 0.00 0.04



DELTA ROLLING MOM. COEF.
-0.08 -0.04 0.00 0.04



-15 -10 -5 0 5 10 15 20
ANGLE OF SIDESLIP, DEGREES

Figure 4-38 (d) Increments, 25°

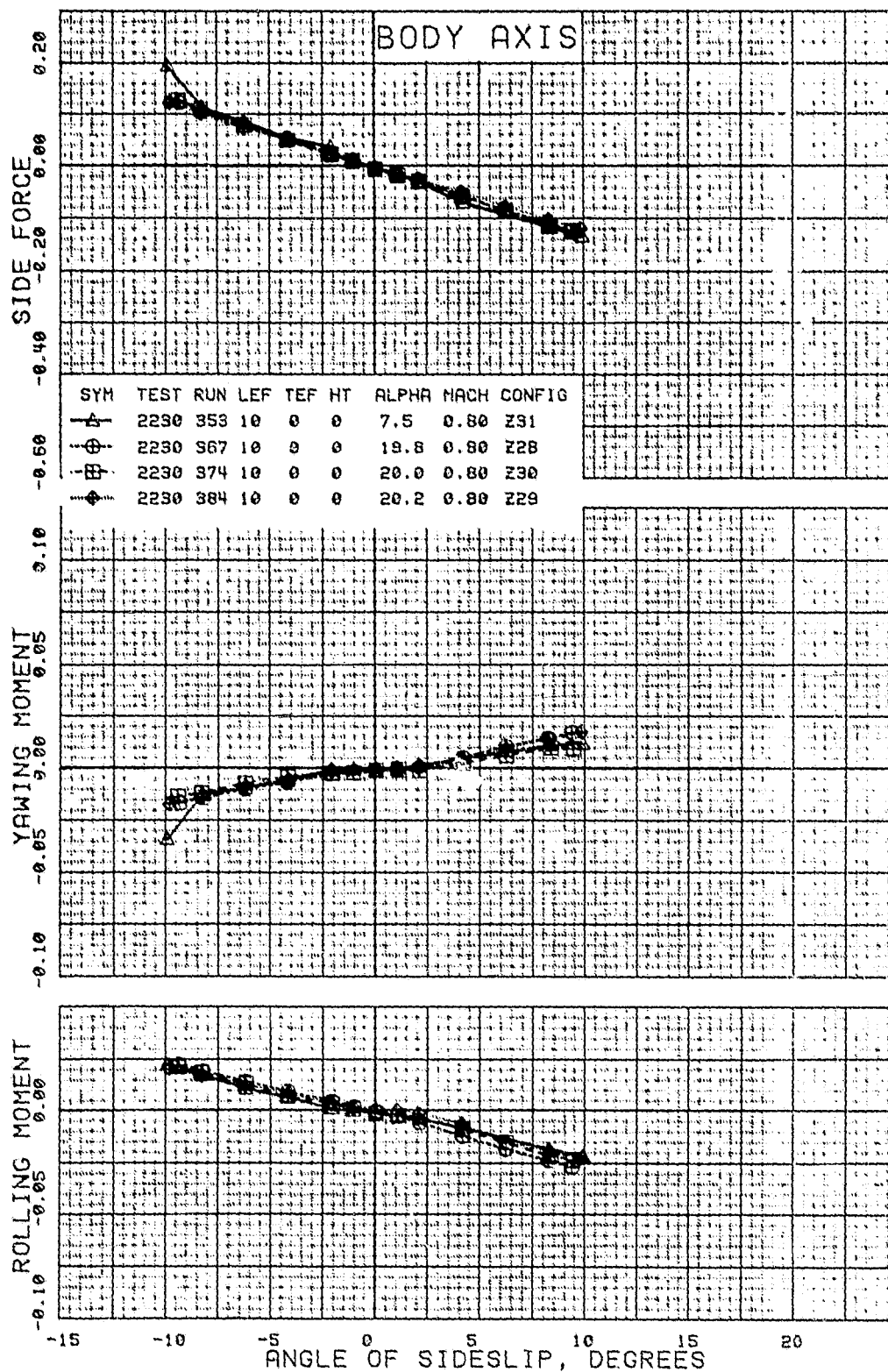


Figure 4-39 Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 10°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

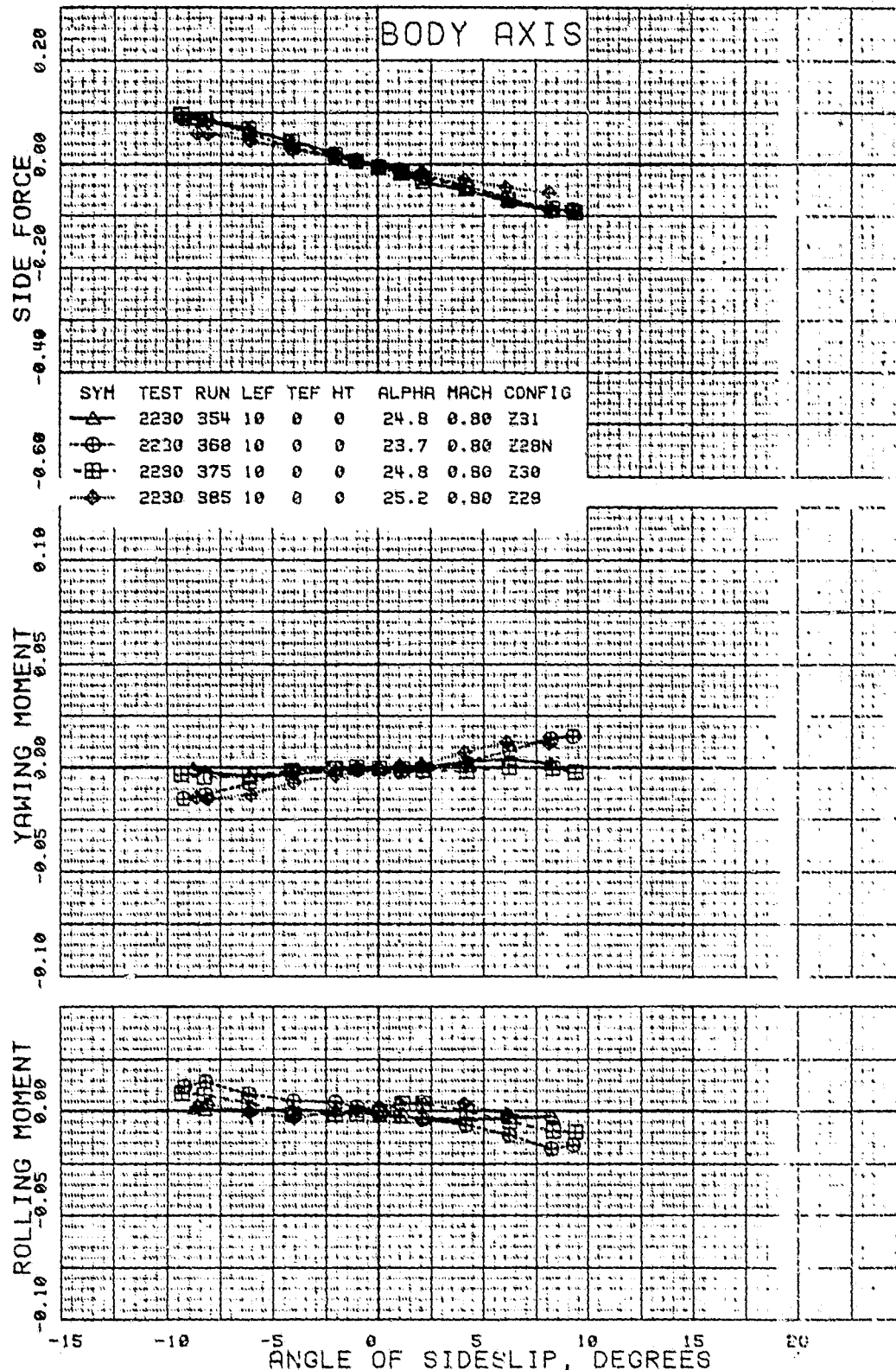


Figure 4-39 (b) Force and Moments, $\alpha = 25^\circ$

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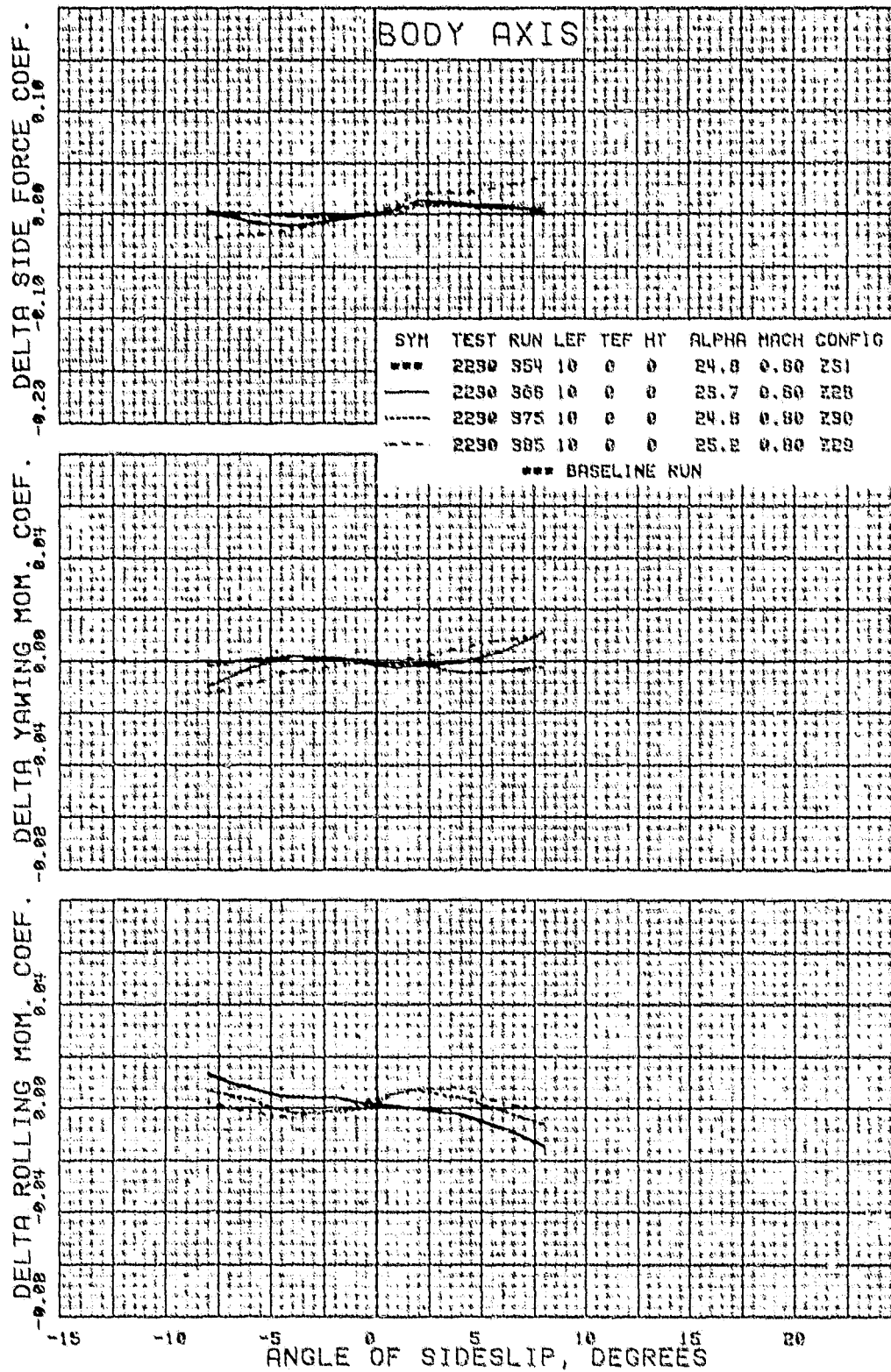


Figure 4-39 (c) Increments, $\alpha = 25^\circ$

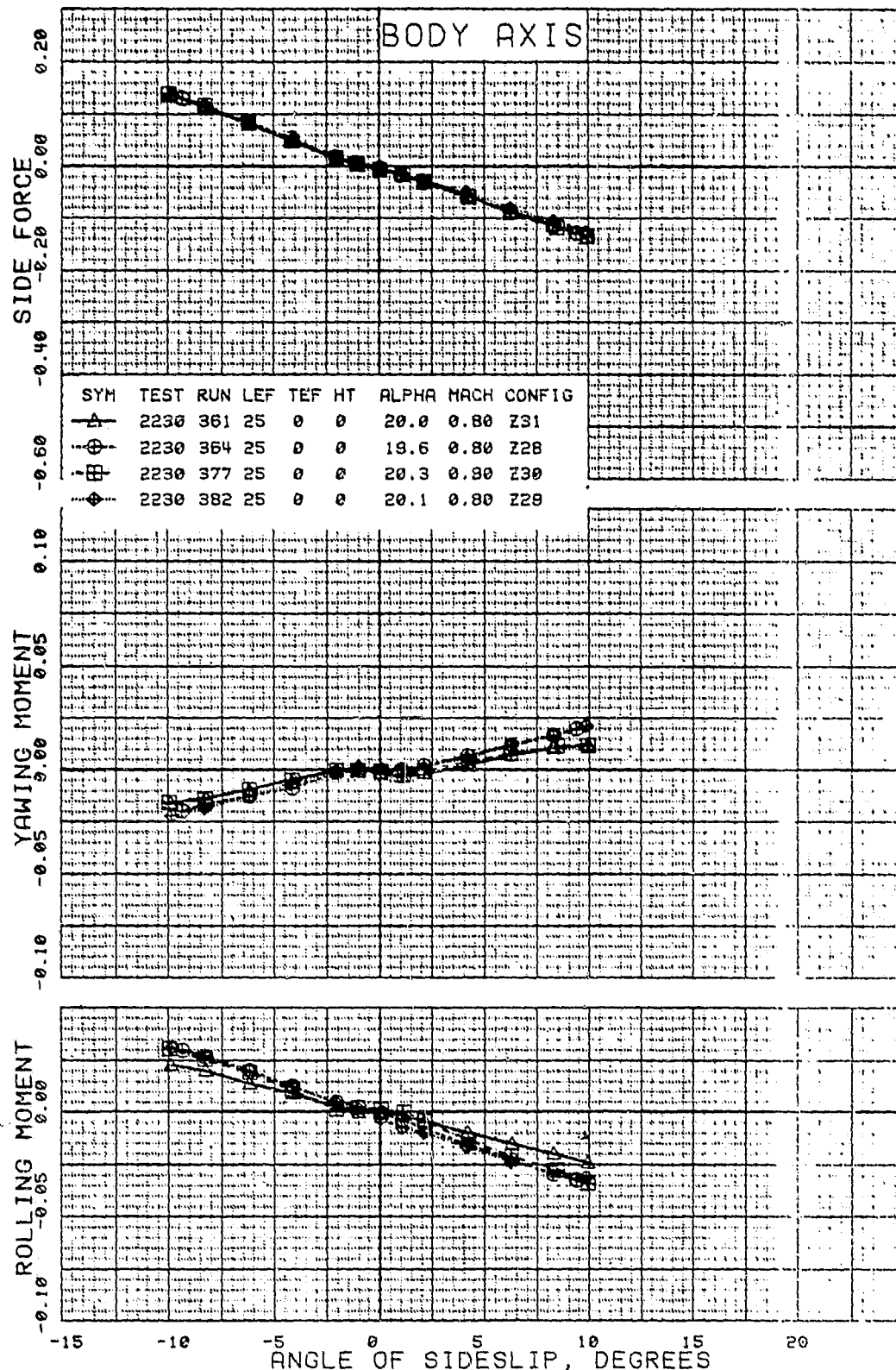


Figure 4-40 Effect of Forebody Strake Shape (Z28-Z31), Configuration 401F-16, LEF = 25°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

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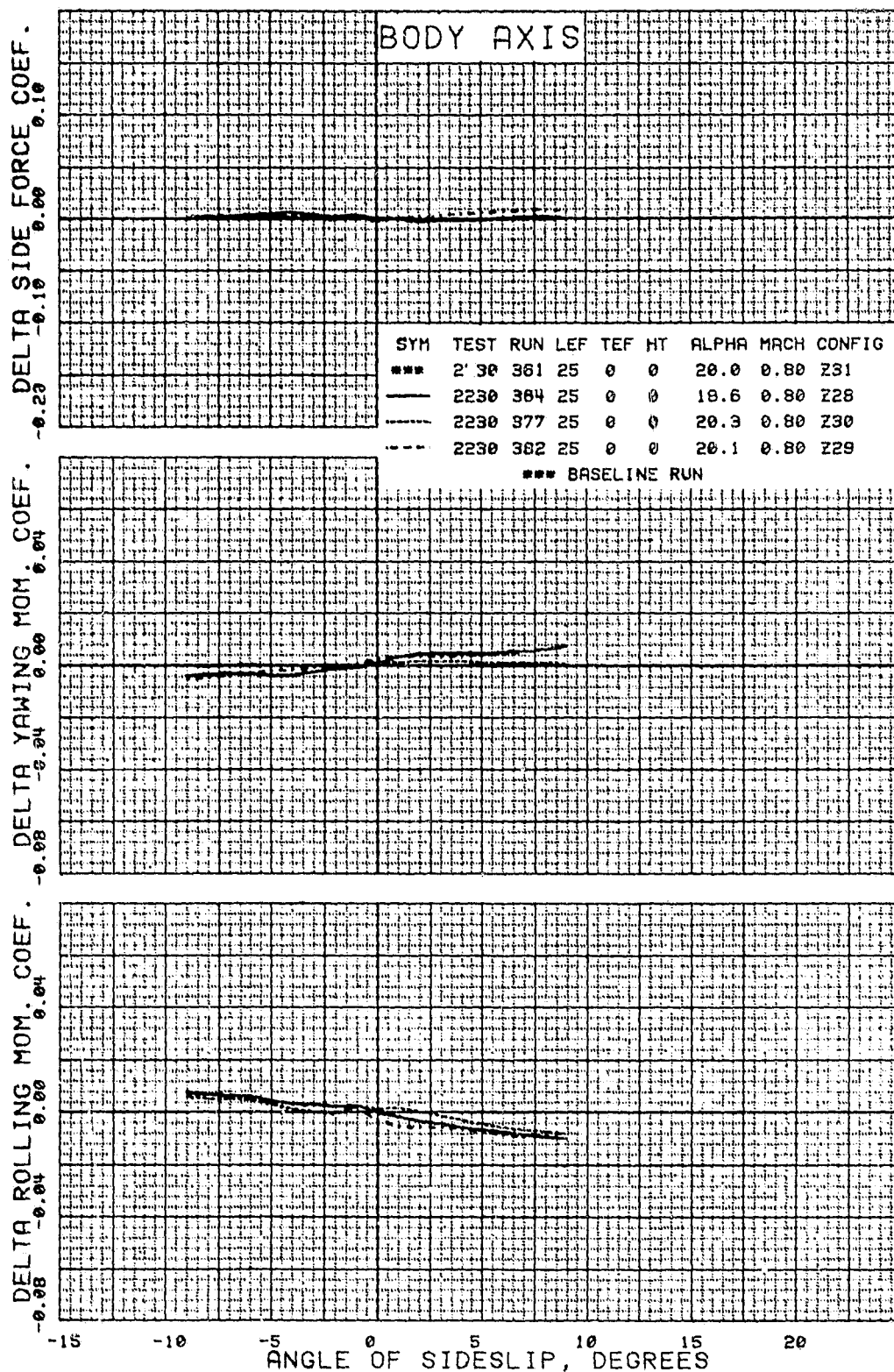


Figure 4-40 (b) Increments, $\alpha = 20^\circ$

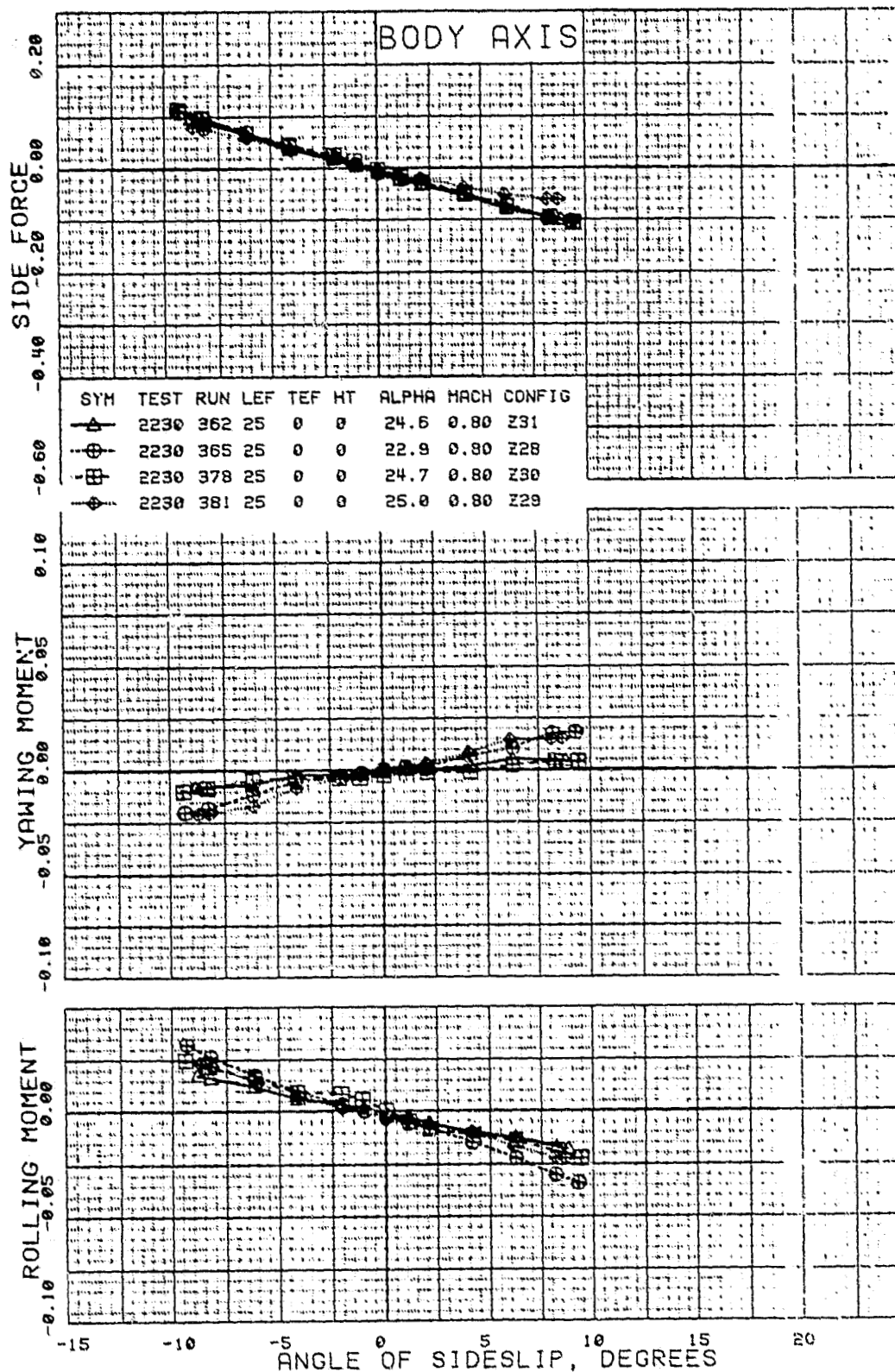


Figure 4-40 (c) Force and Moments, $\alpha = 25^\circ$

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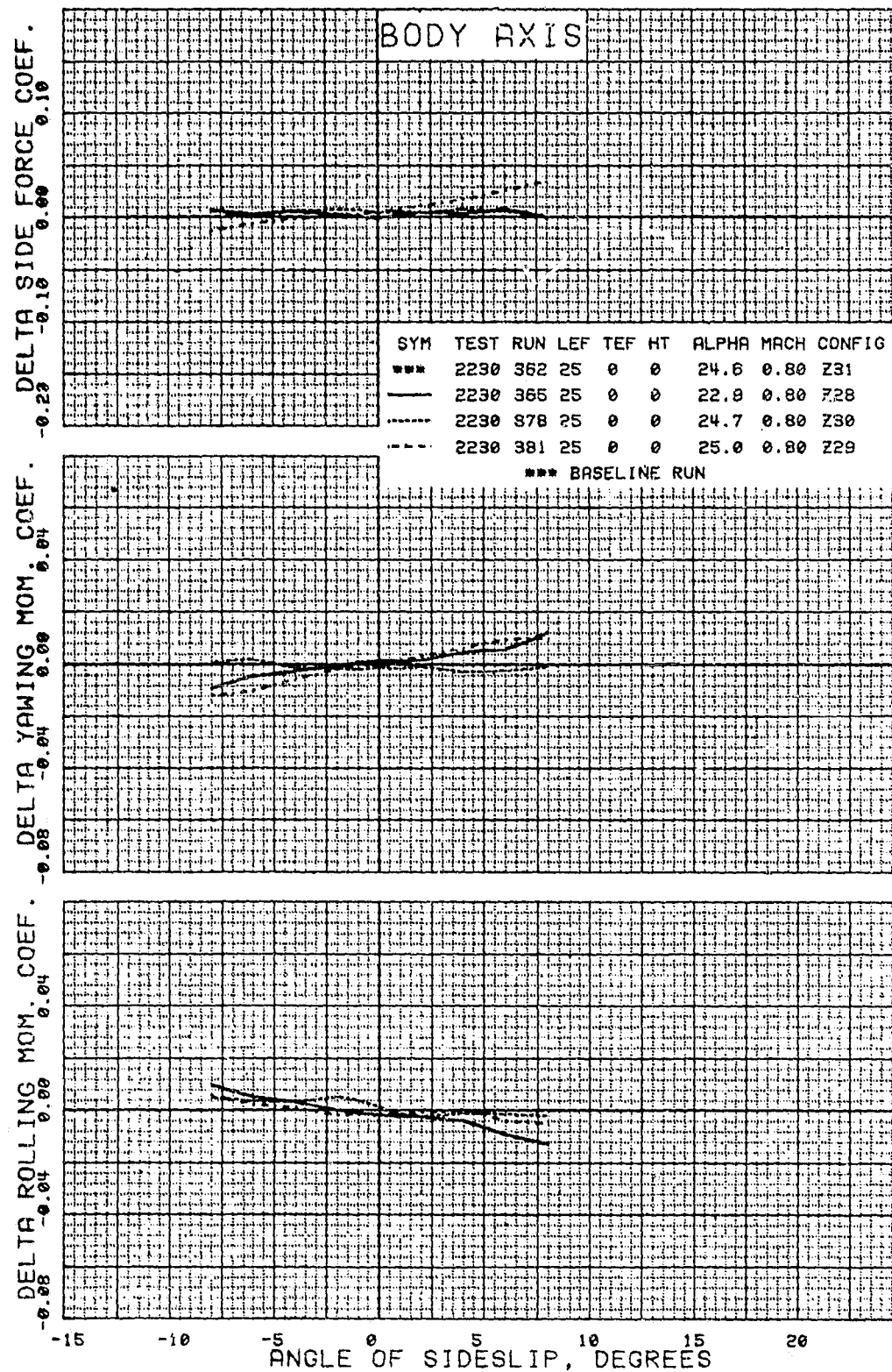


Figure 4-40 (d) Increments, $\alpha = 25^\circ$

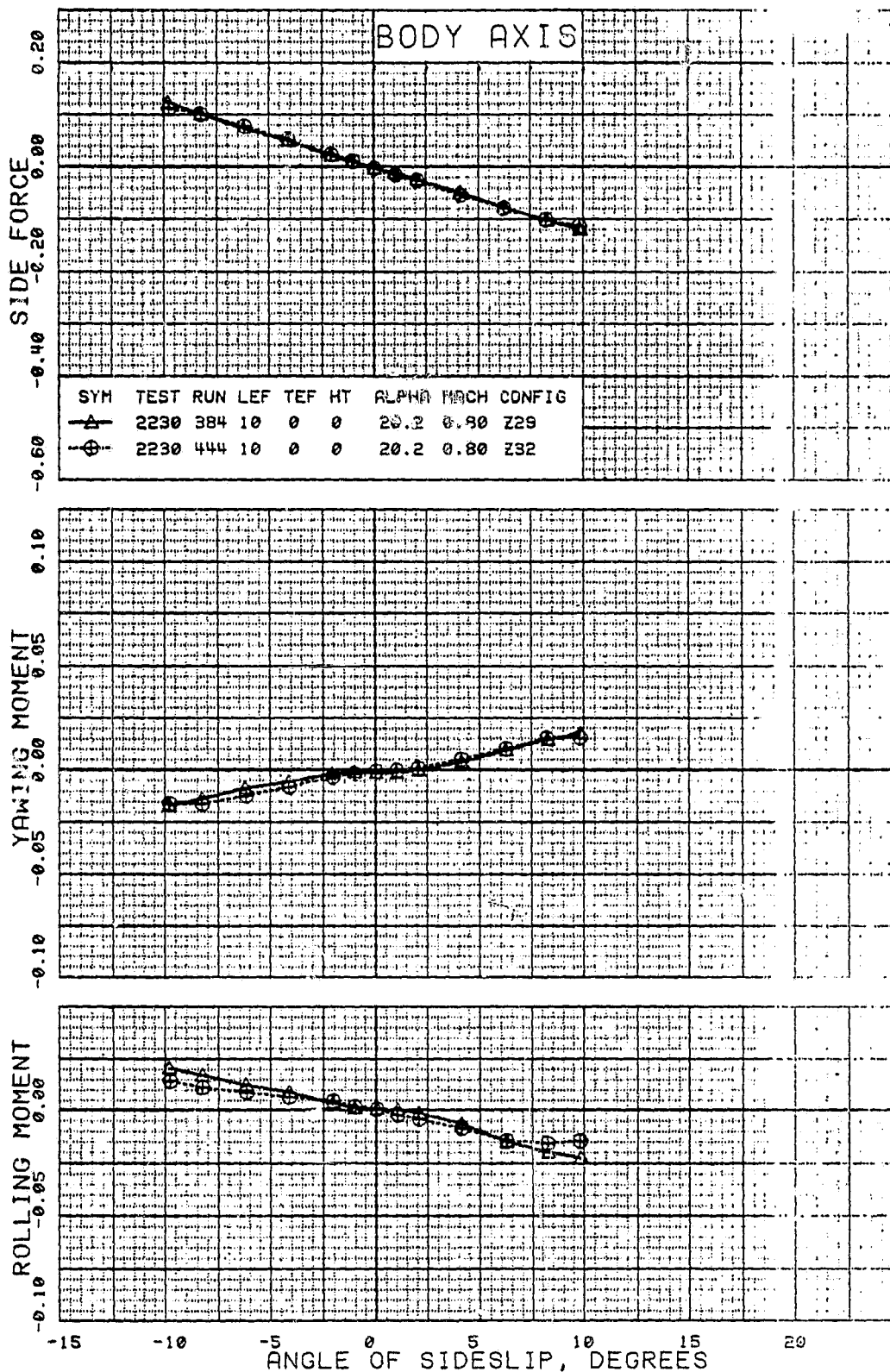


Figure 4-41 Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 10°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

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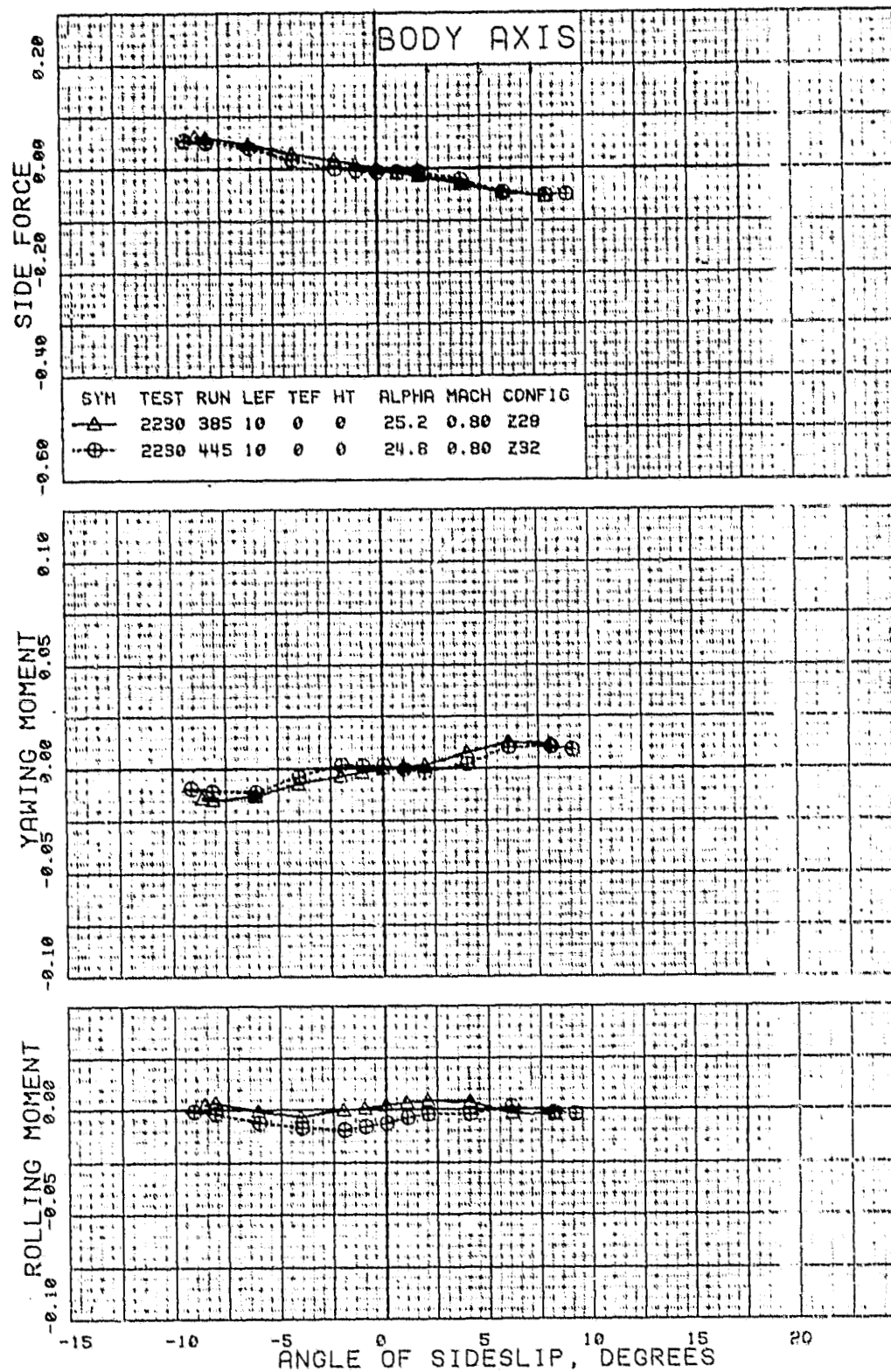


Figure 4-41 (b) Force and Moments, $\alpha = 25^\circ$

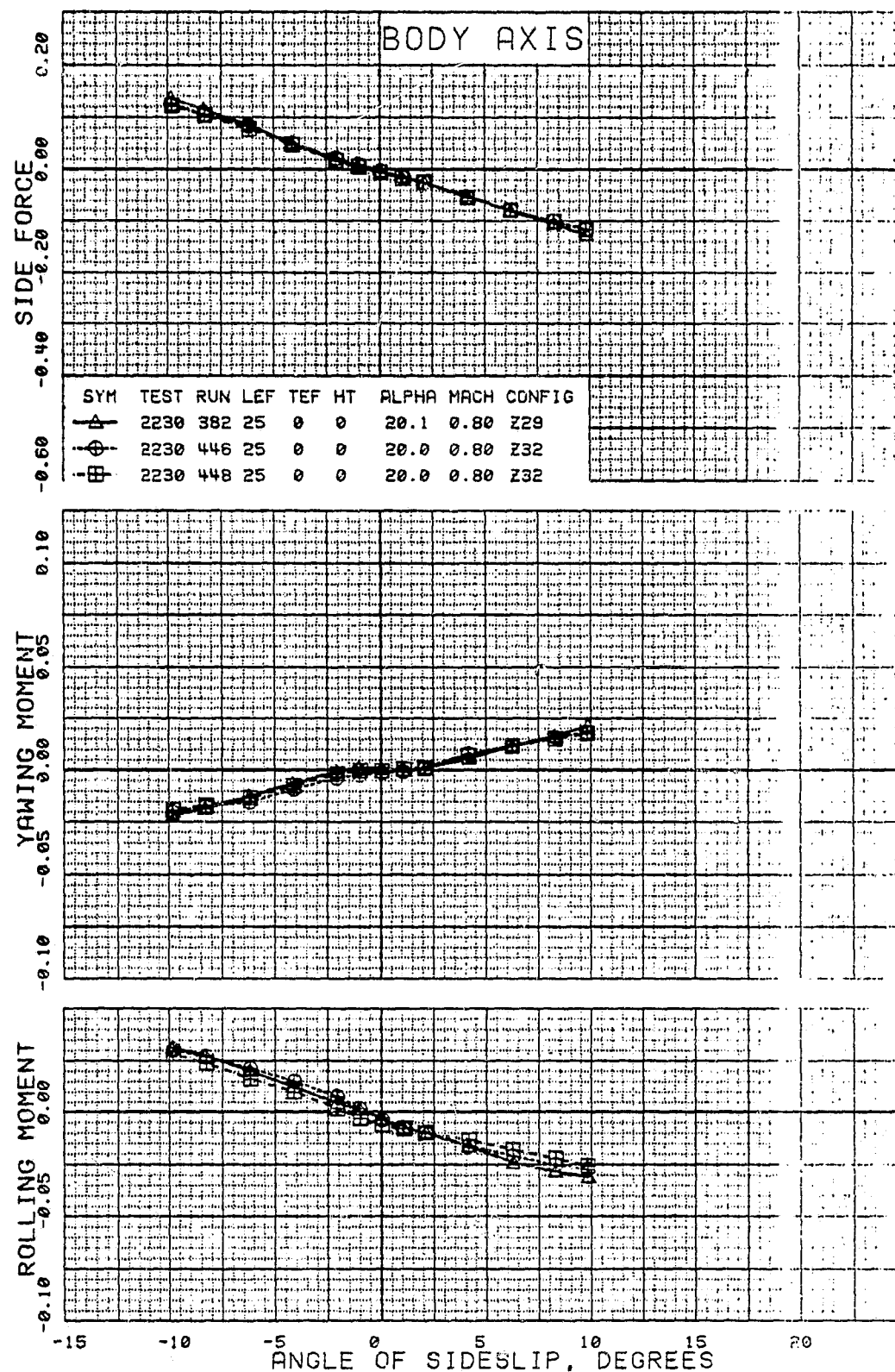


Figure 4-42 Effect of Forebody Strakes Z29 and Z32, Configuration 401F-16, LEF = 25°, M = 0.80
(a) Force and Moments, $\alpha = 20^\circ$

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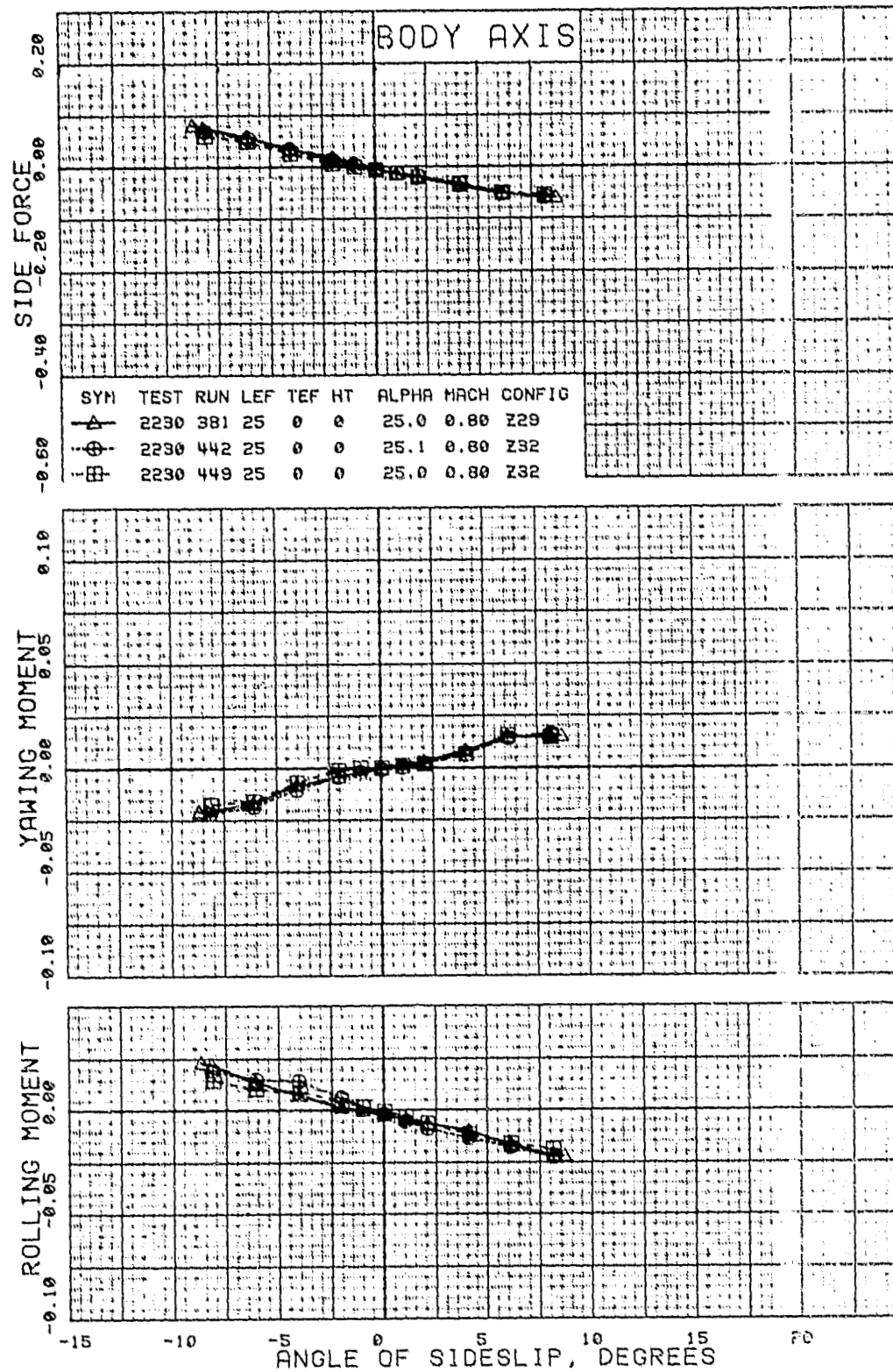


Figure 4-42 (b) Force and Moments, $\alpha = 25^\circ$

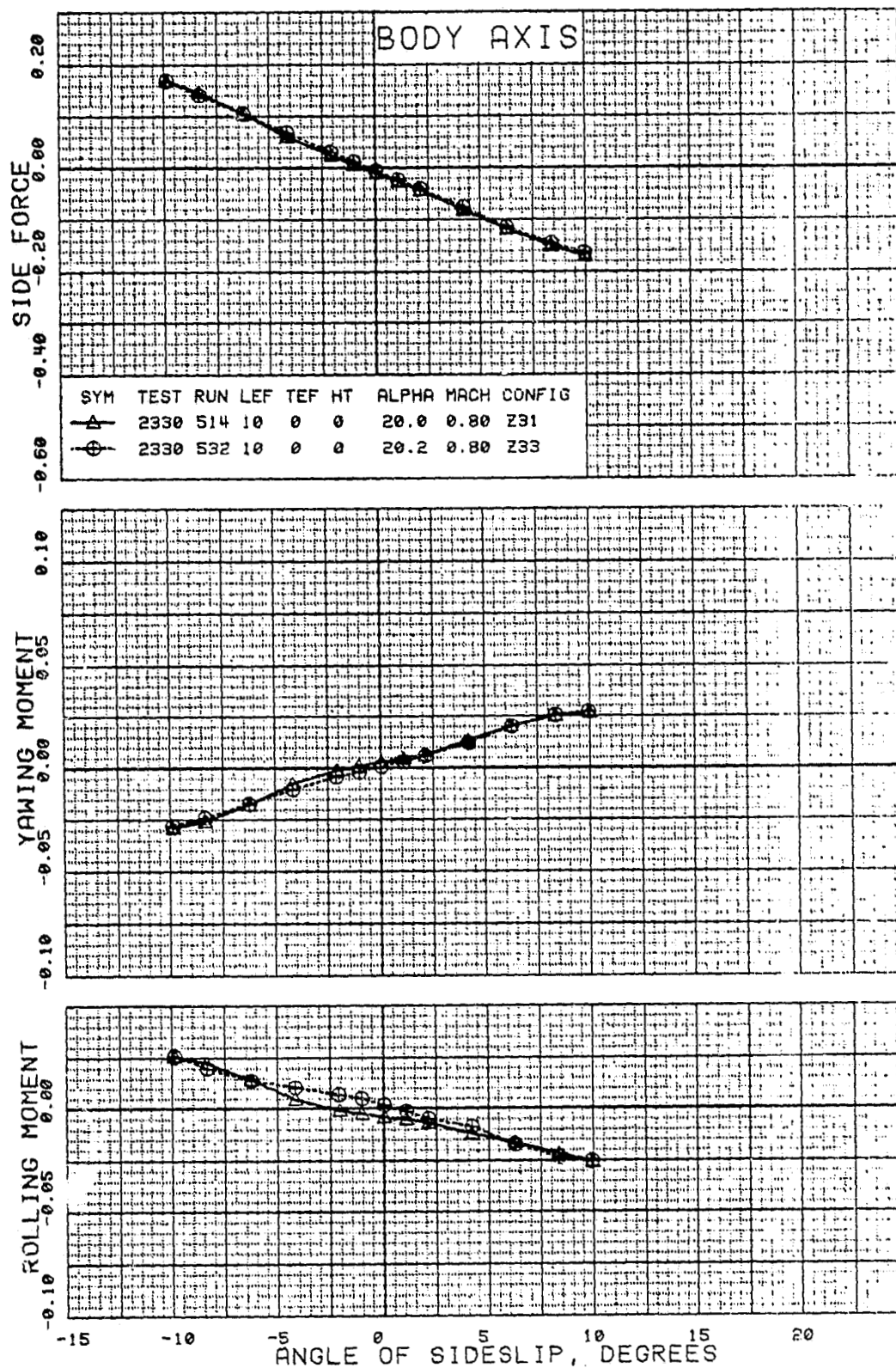


Figure 4-43 Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 10°, M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$

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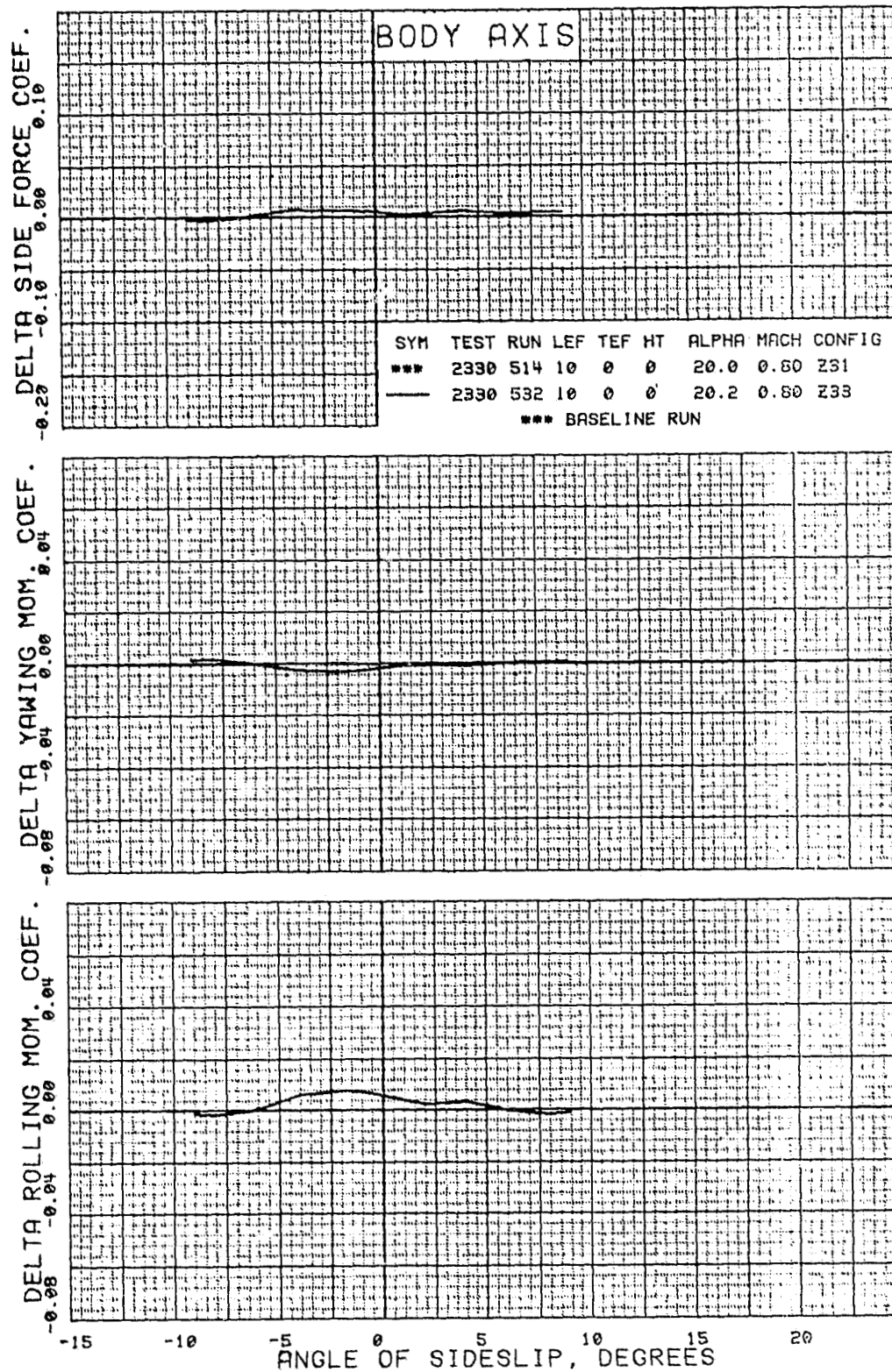


Figure 4-43 (b) Increments, $\alpha = 20^\circ$

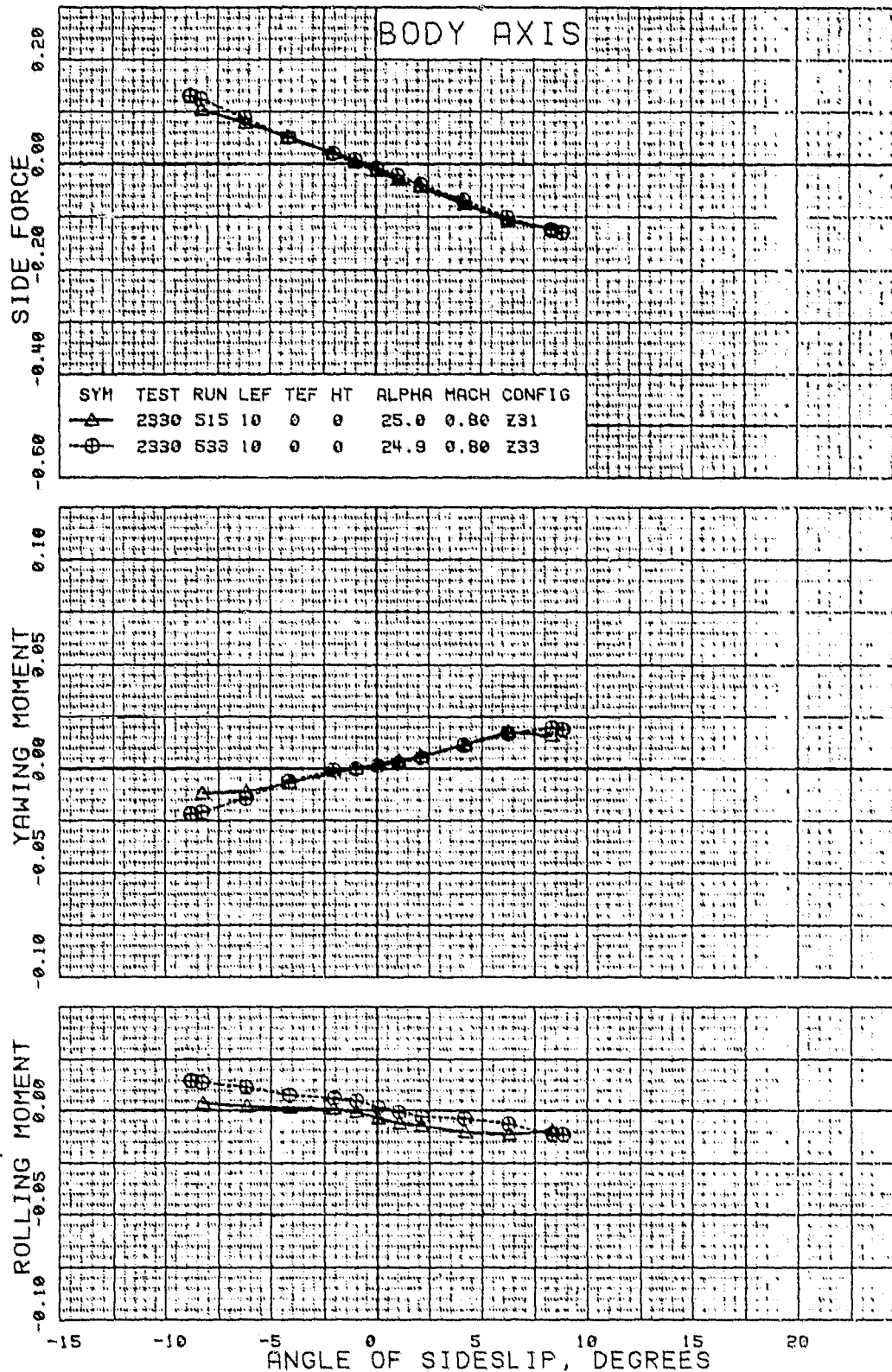


Figure 4-43 (c) Force and Moments, $\alpha = 25^\circ$

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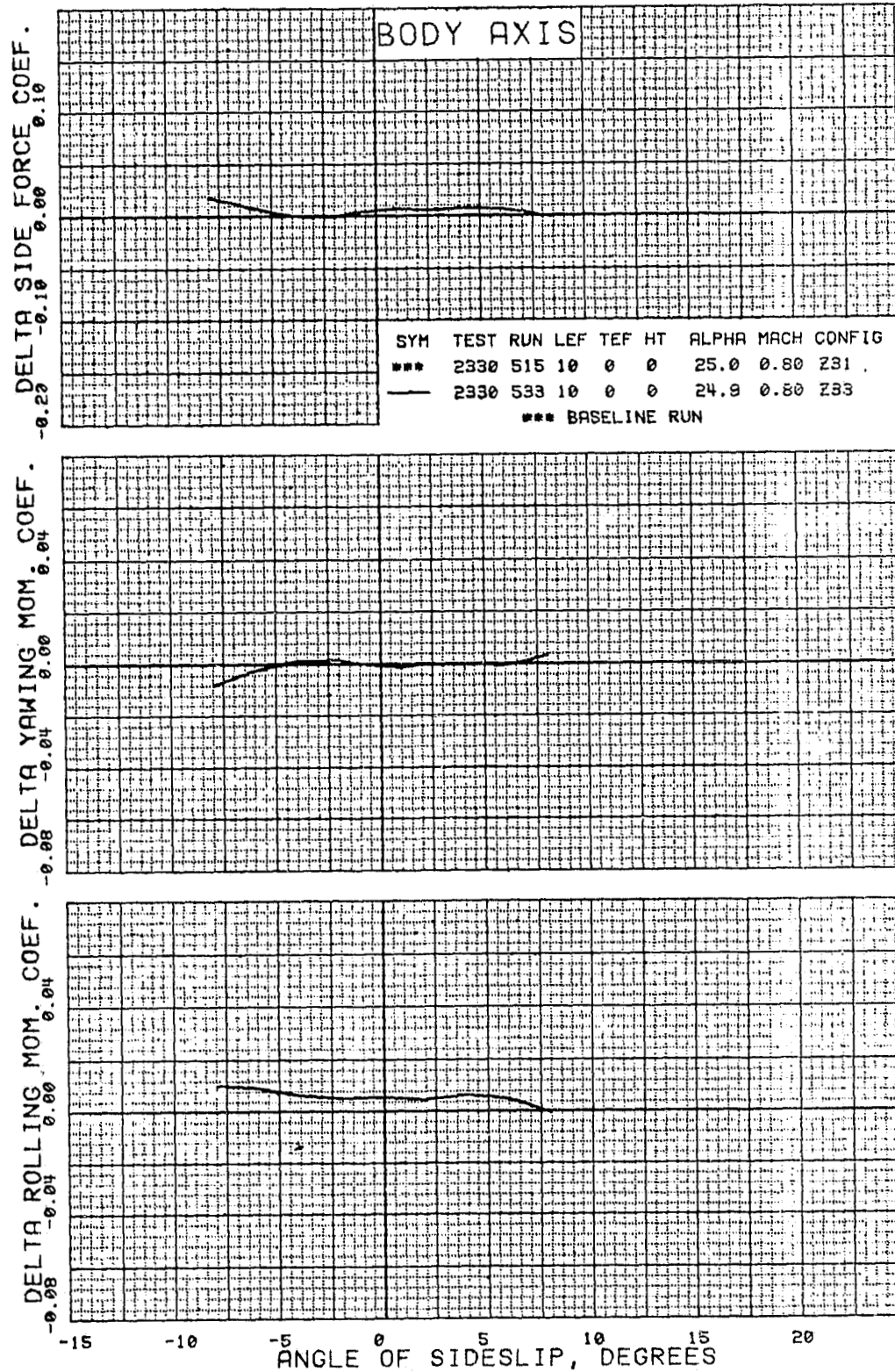


Figure 4-43 (d) Increments, $\alpha = 25^\circ$

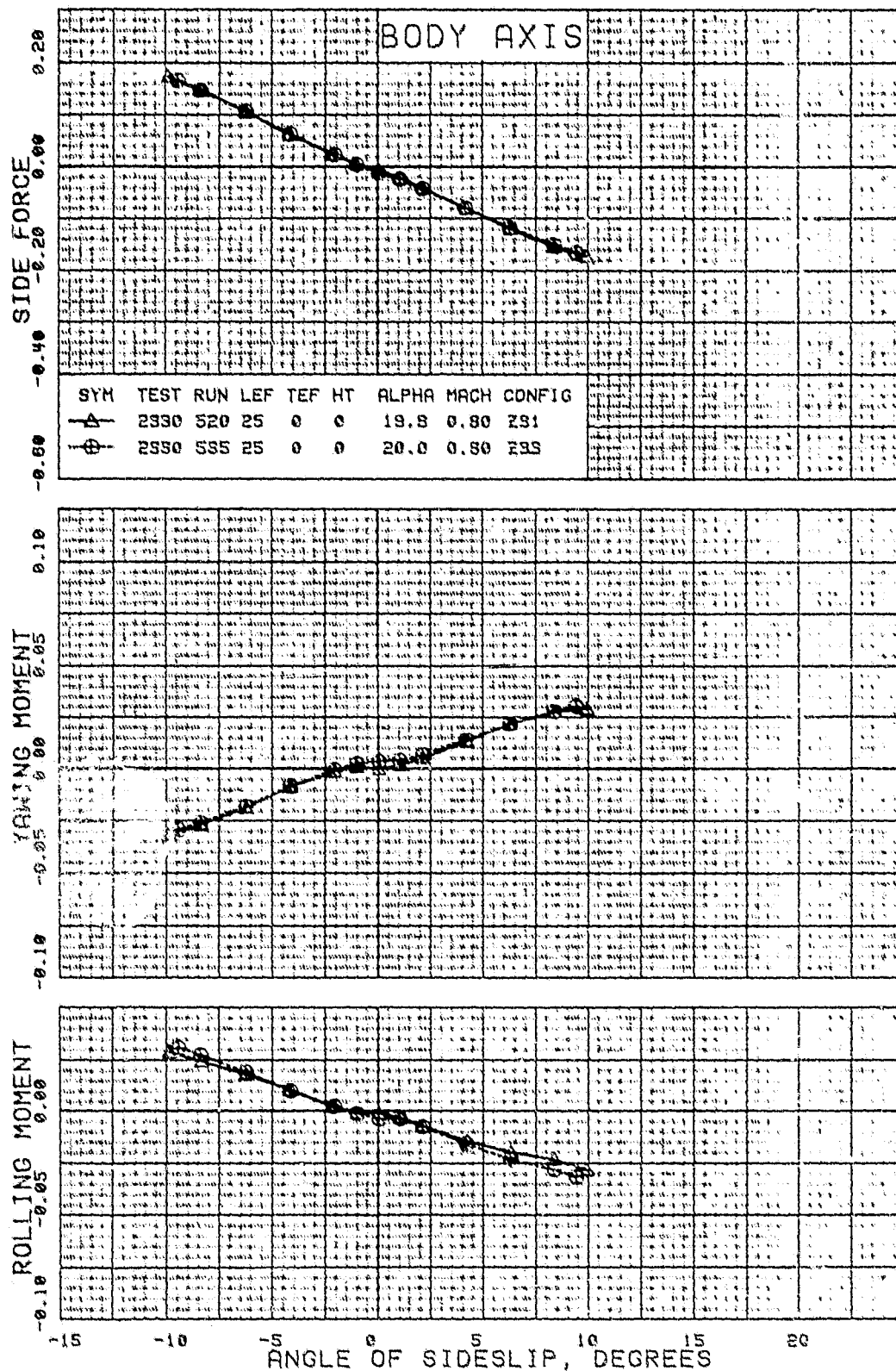


Figure 4-44 Effect of Forebody Strakes Z31 and Z33, Configuration 401F-16, LEF = 25°, M = 0.80 (a) Force and Moments, $\alpha = 20^\circ$

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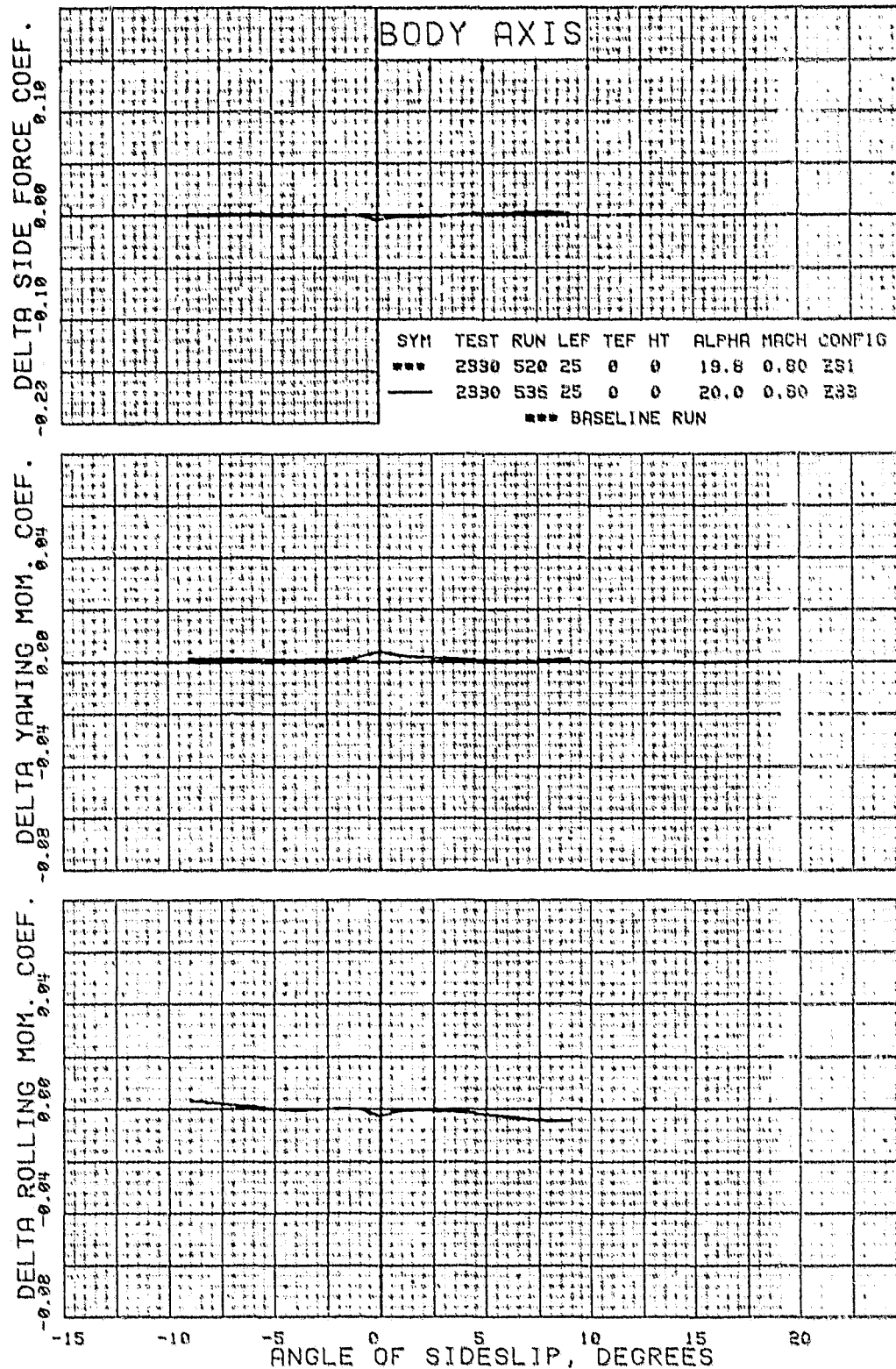


Figure 4-44 (b) Increments, $\alpha = 20^\circ$

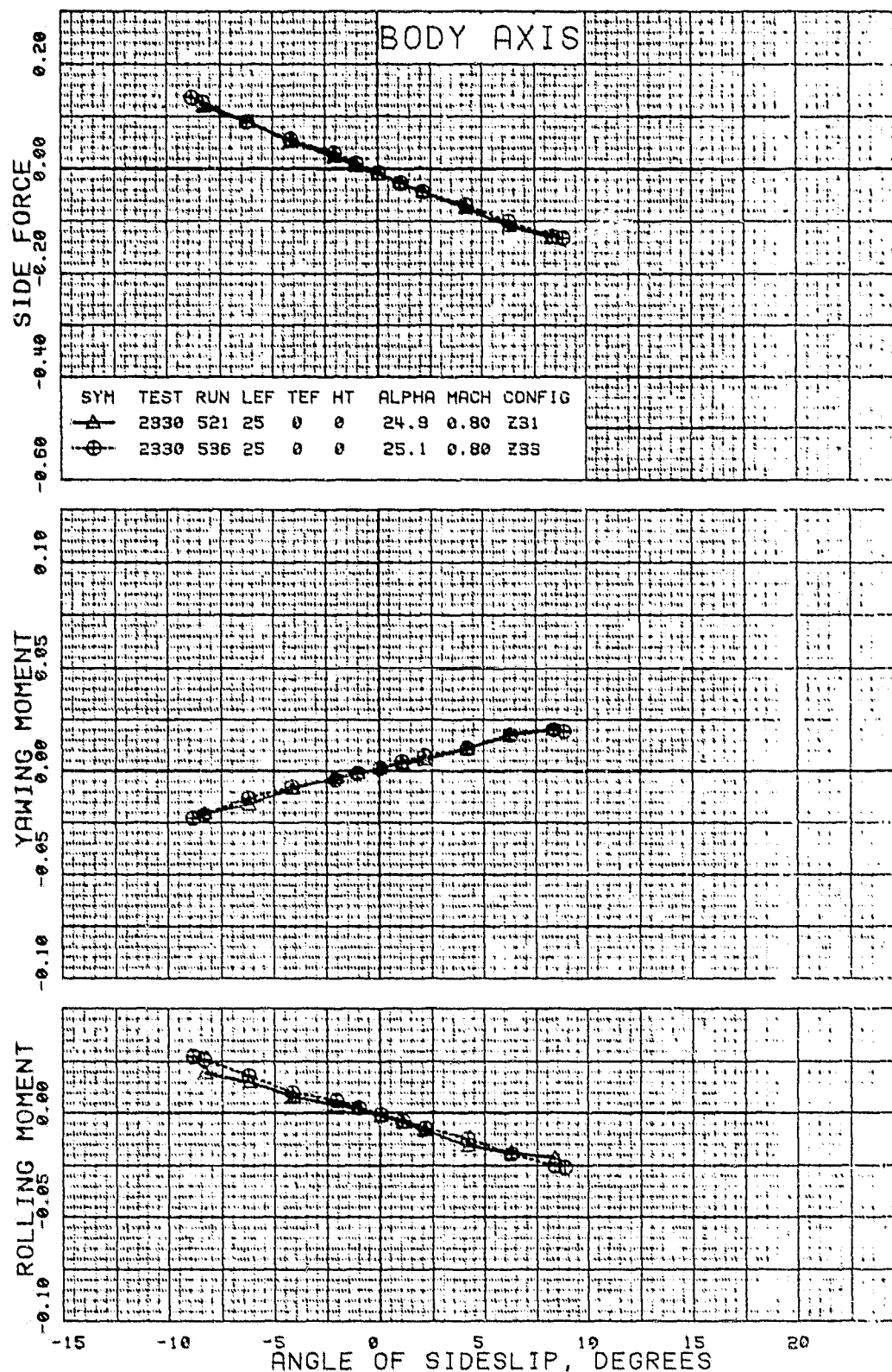


Figure 4-44 (c) Force and Moments, $\alpha = 25^\circ$

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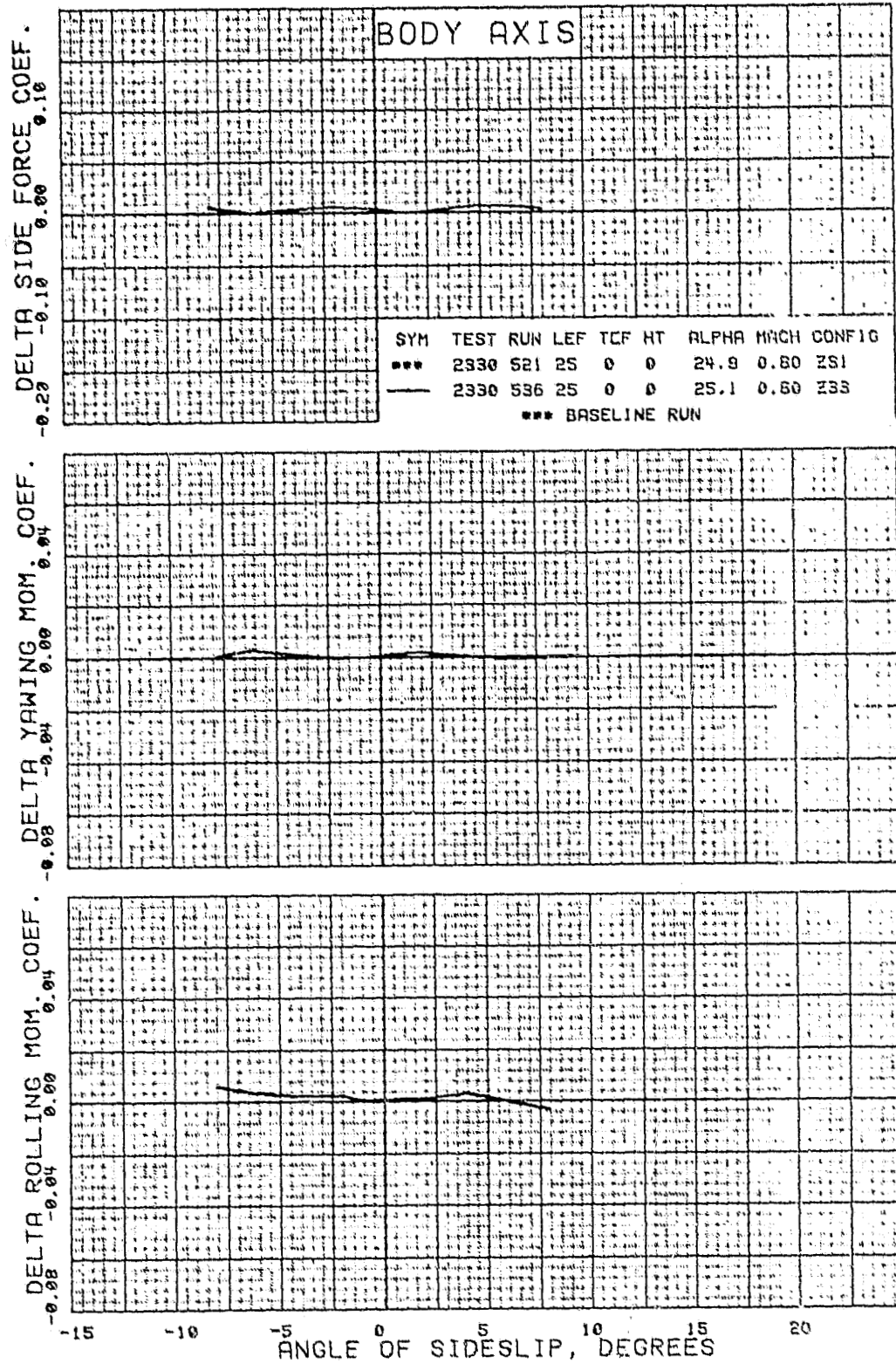


Figure 4-44 (d) Increments, $\alpha = 25^\circ$

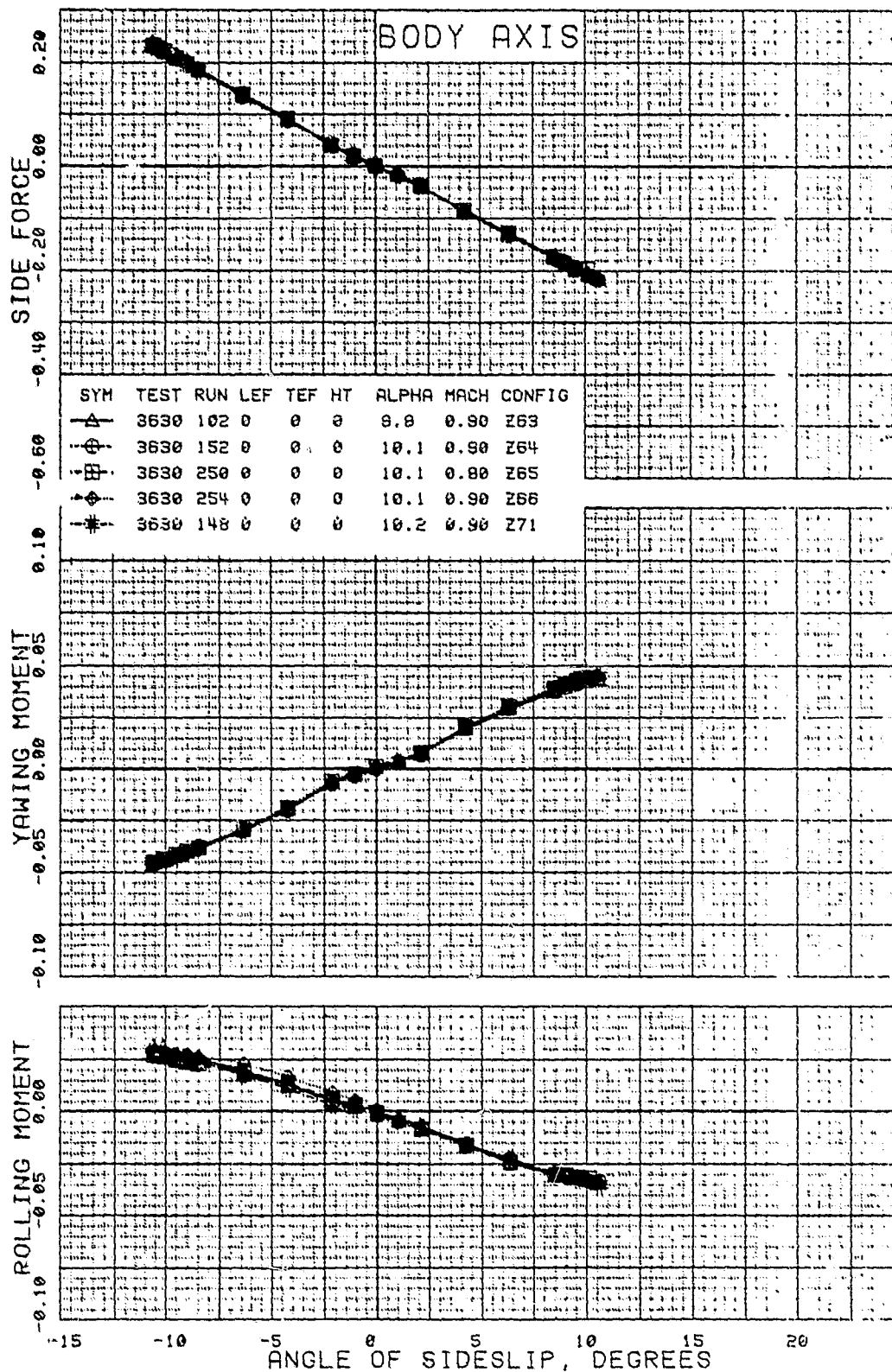


Figure 4-45 Effect of Forebody Strake Shape (Z63-Z66, Z71), YF-16 + 30.5 Stretch, LEF = 0, M = 0.90
(a) Force and Moments, $\alpha = 10^\circ$

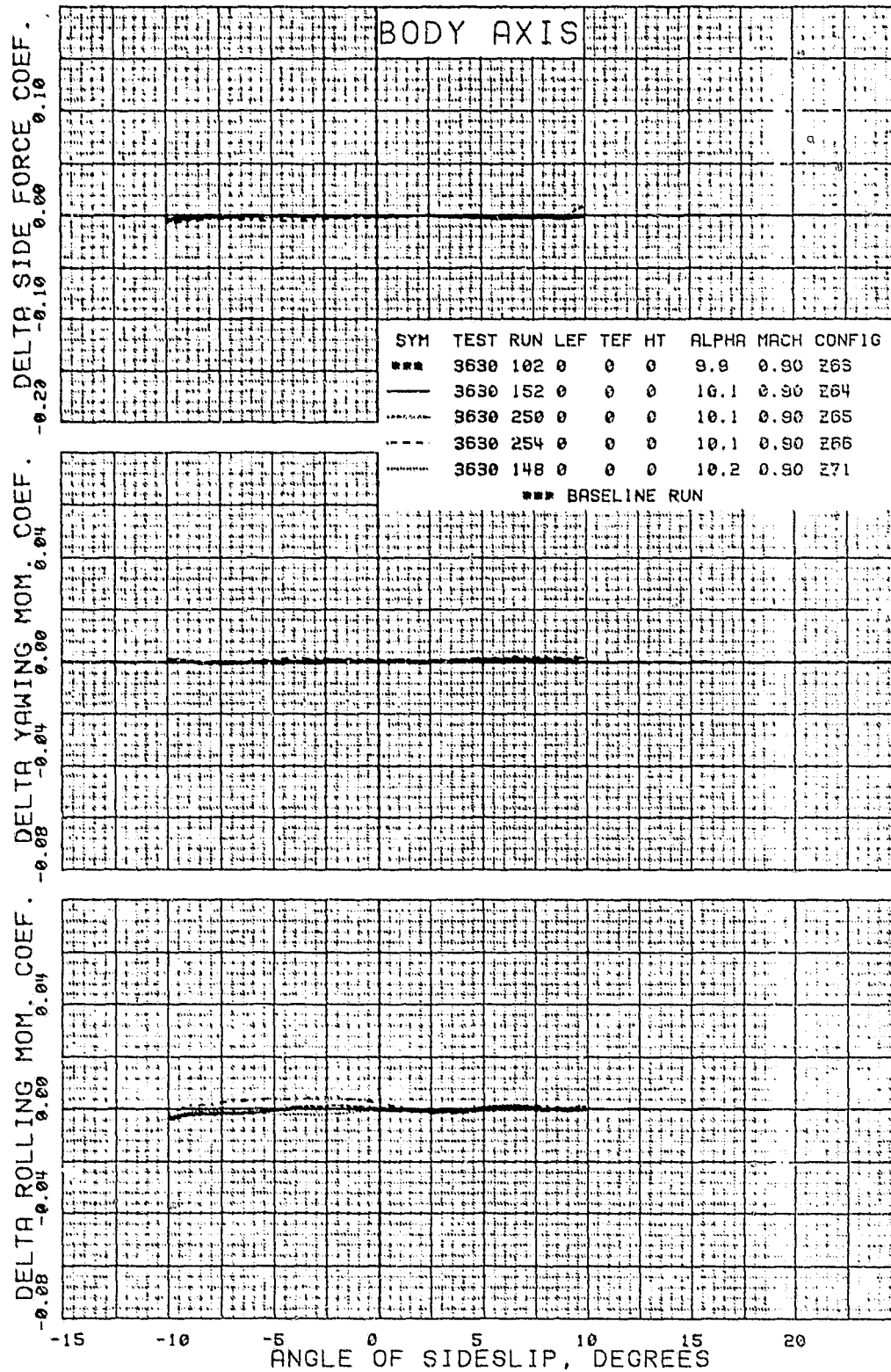


Figure 4-45 (b) Increments, $\alpha = 10^\circ$

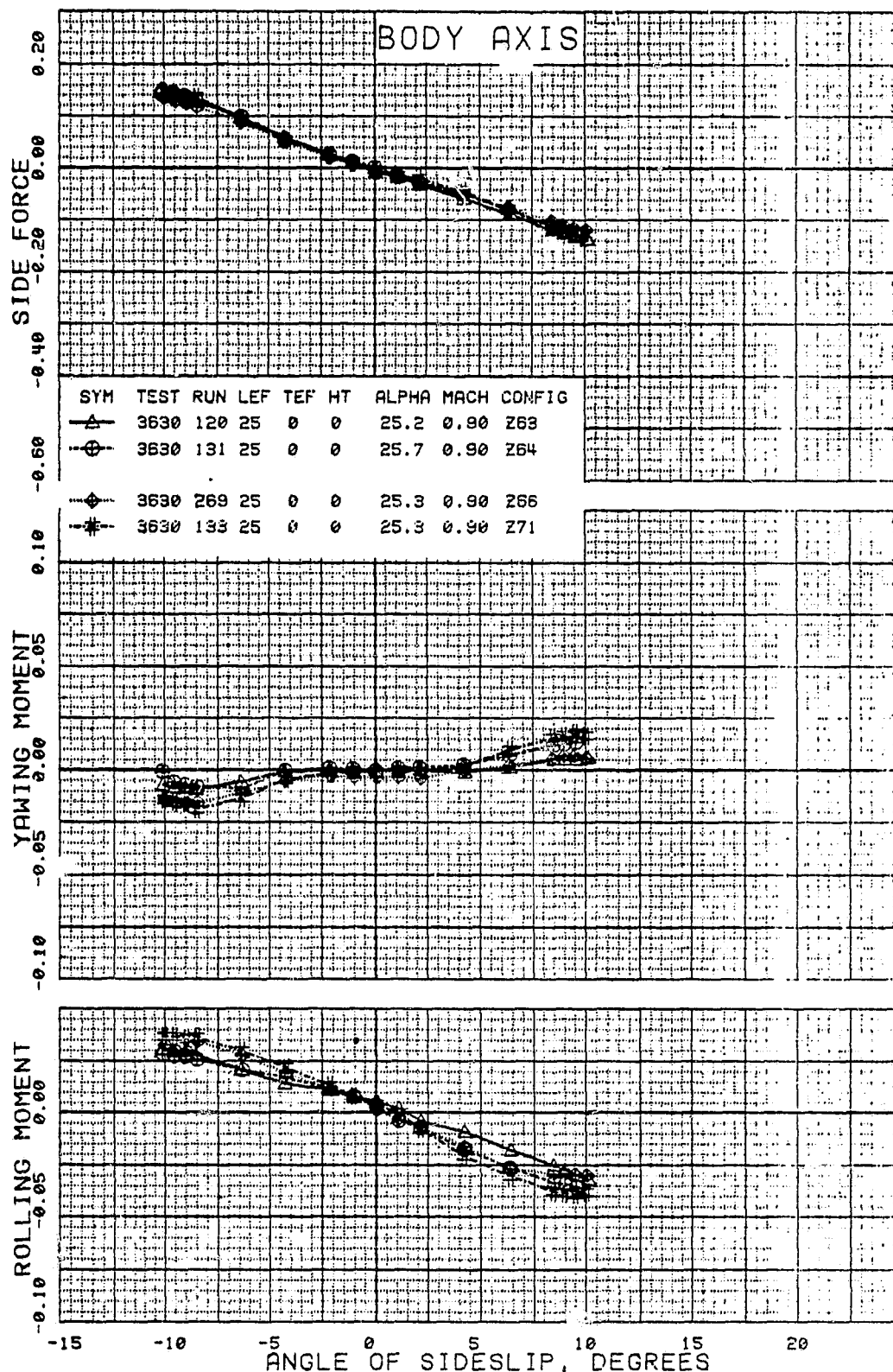


Figure 4-46 Effect of Forebody Strake Shape (Z63-Z66,Z71),
YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90
(a) Force and Moments, $\alpha = 25^\circ$

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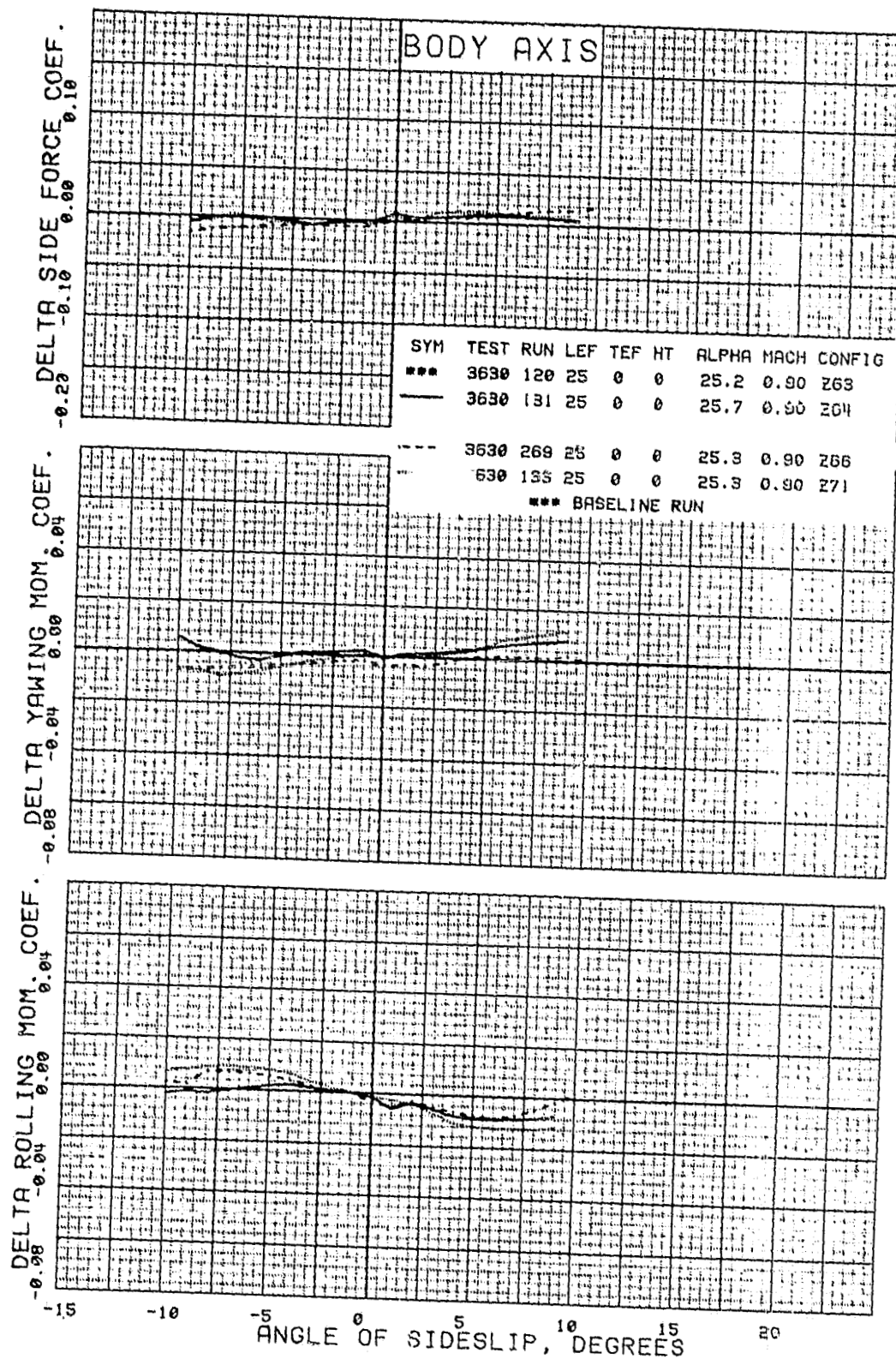


Figure 4-46 (b) Increments, $\alpha = 25^\circ$

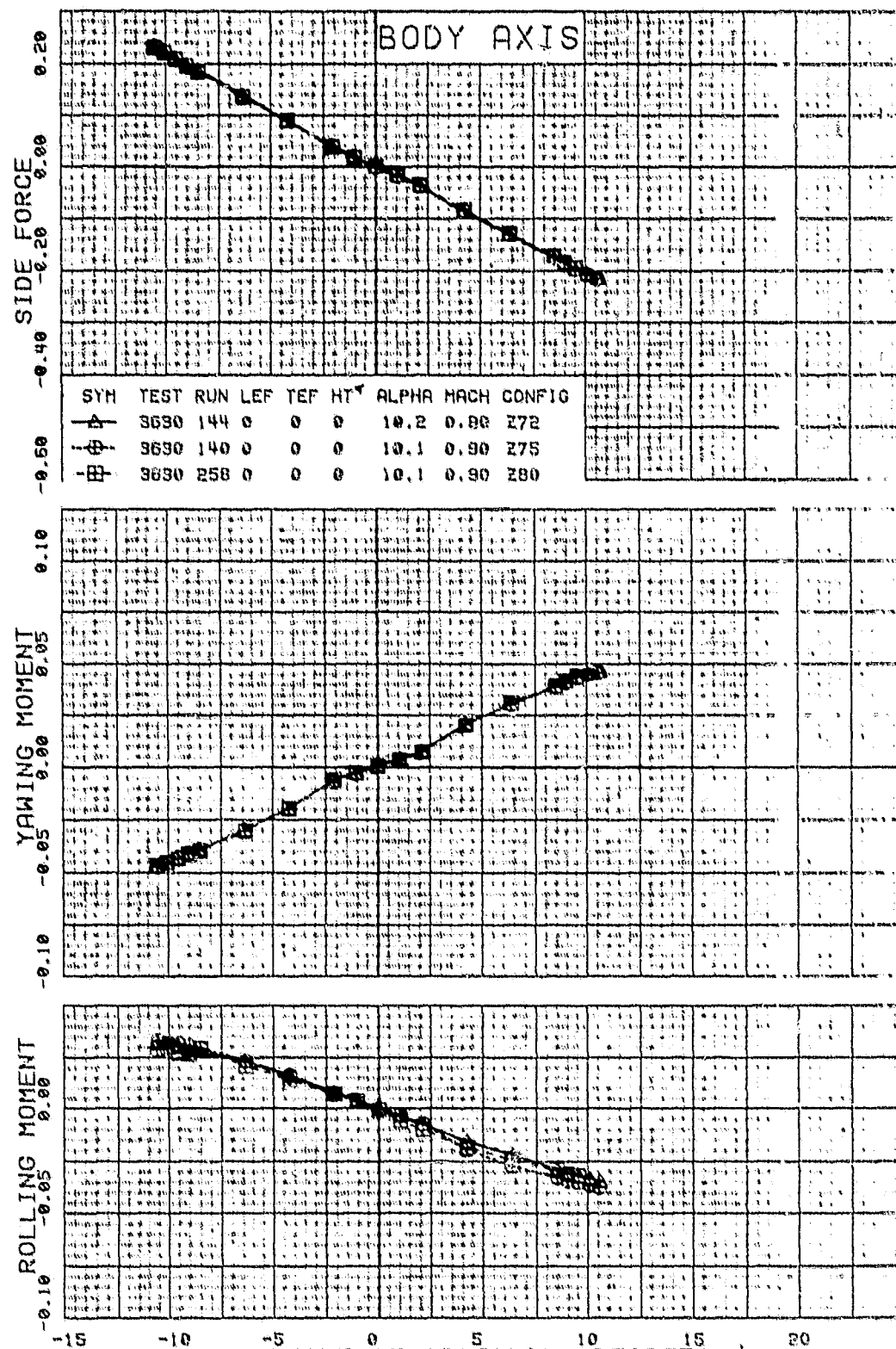


Figure 4-47 Effect of Forebody Stroke Size (Z72,Z75, Z80),
YF-16 + 30.5 Stretch, LEF = 0°, M = 0.90
(a) Force and Moments, $\alpha = 10^\circ$

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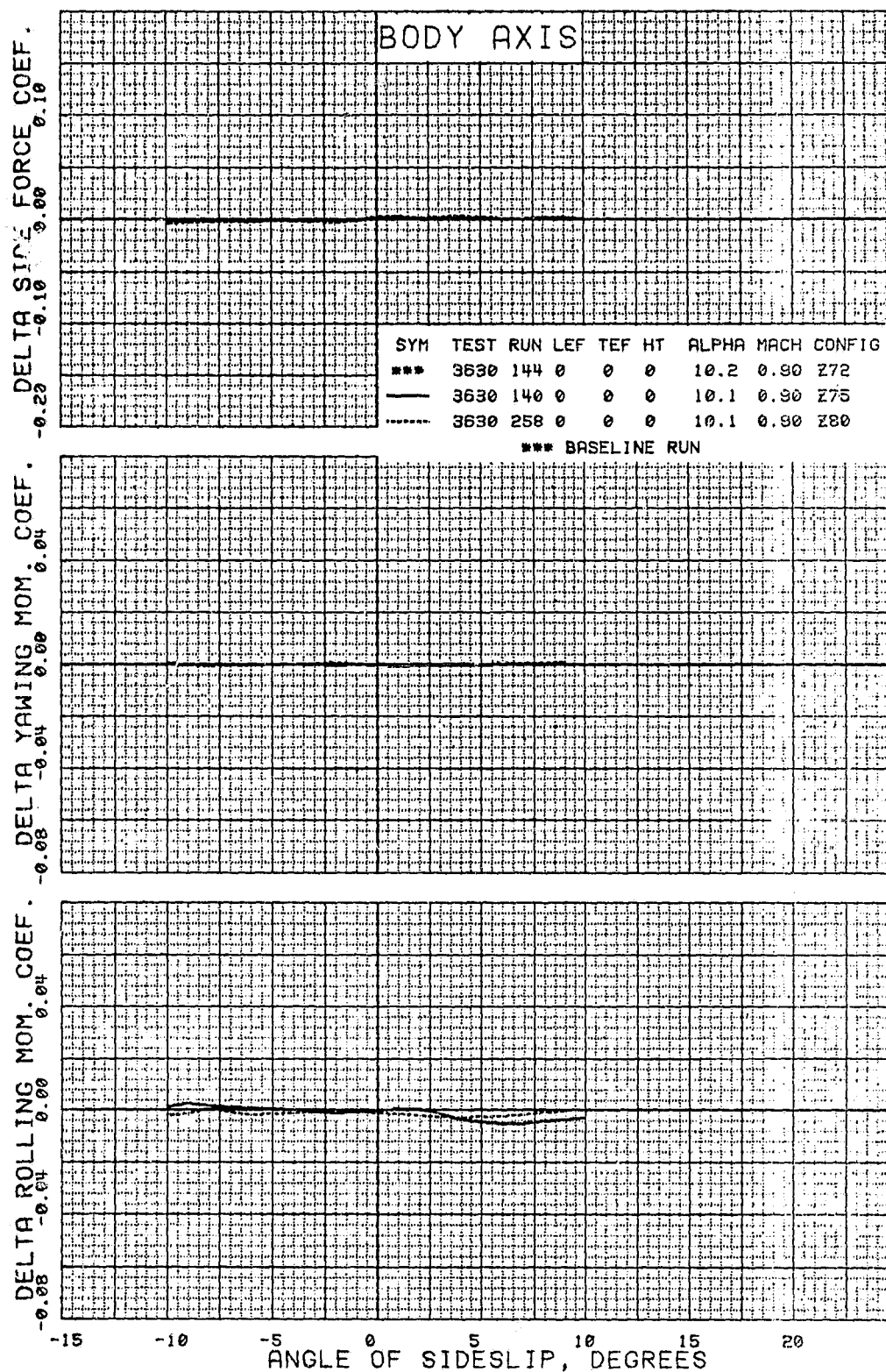


Figure 4-47 (b) Increments, $\alpha = 10^\circ$

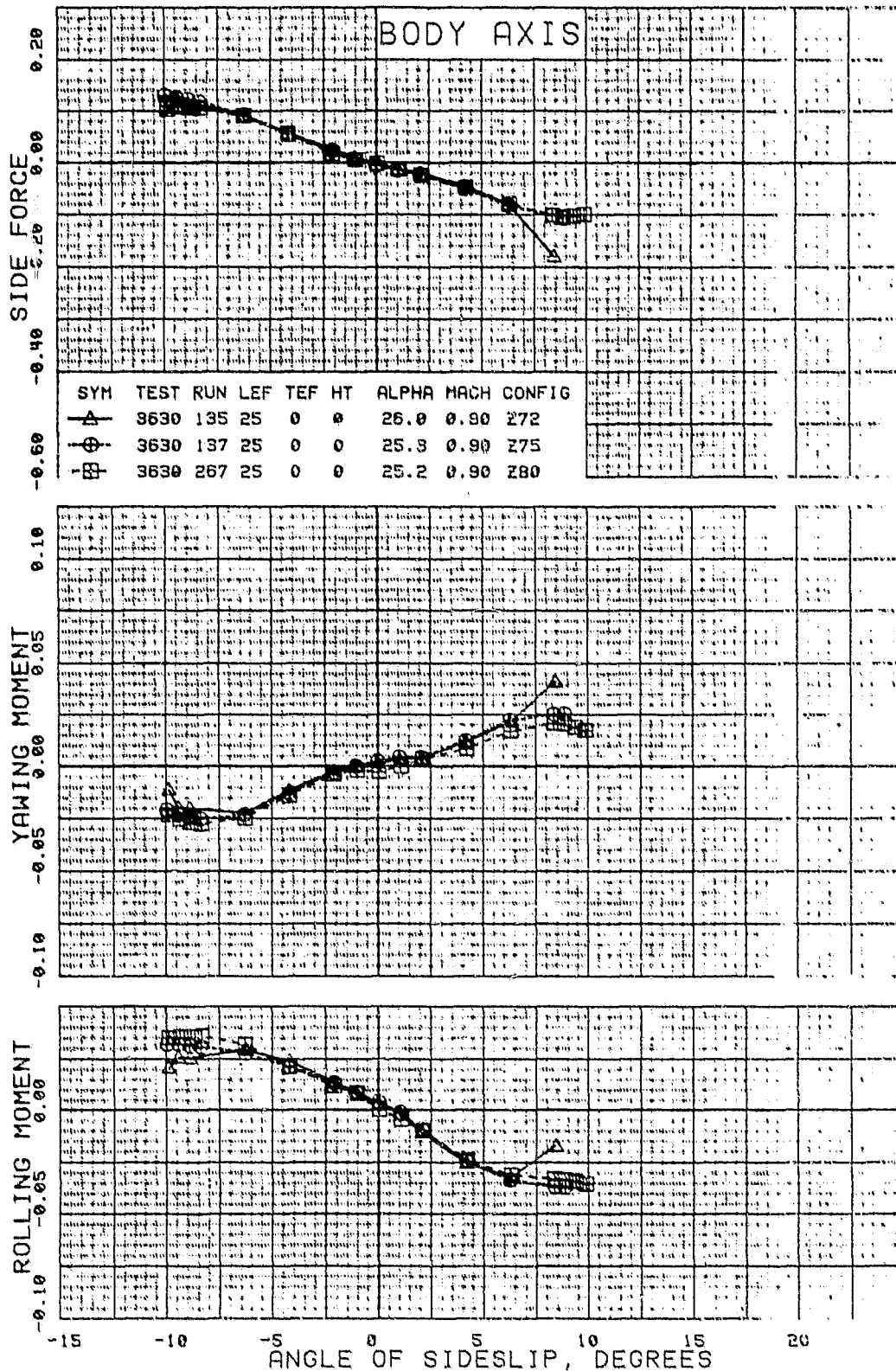


Figure 4-48 Effect of Forebody Strake Size (Z72,Z75,Z80),
YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90
(a) Force and Moments, 25°

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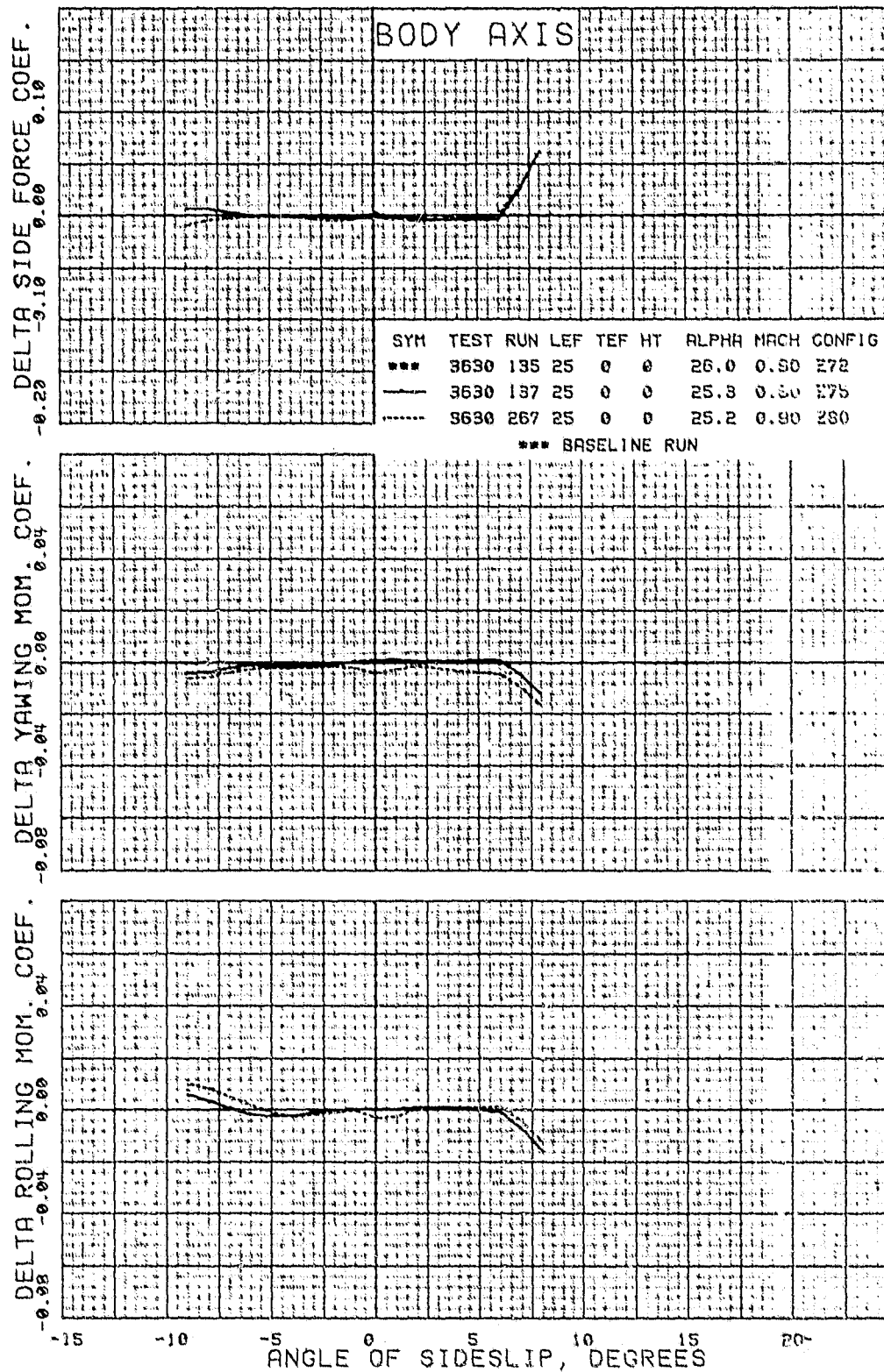


Figure 4-48 (b) Increments, $\alpha = 25^\circ$

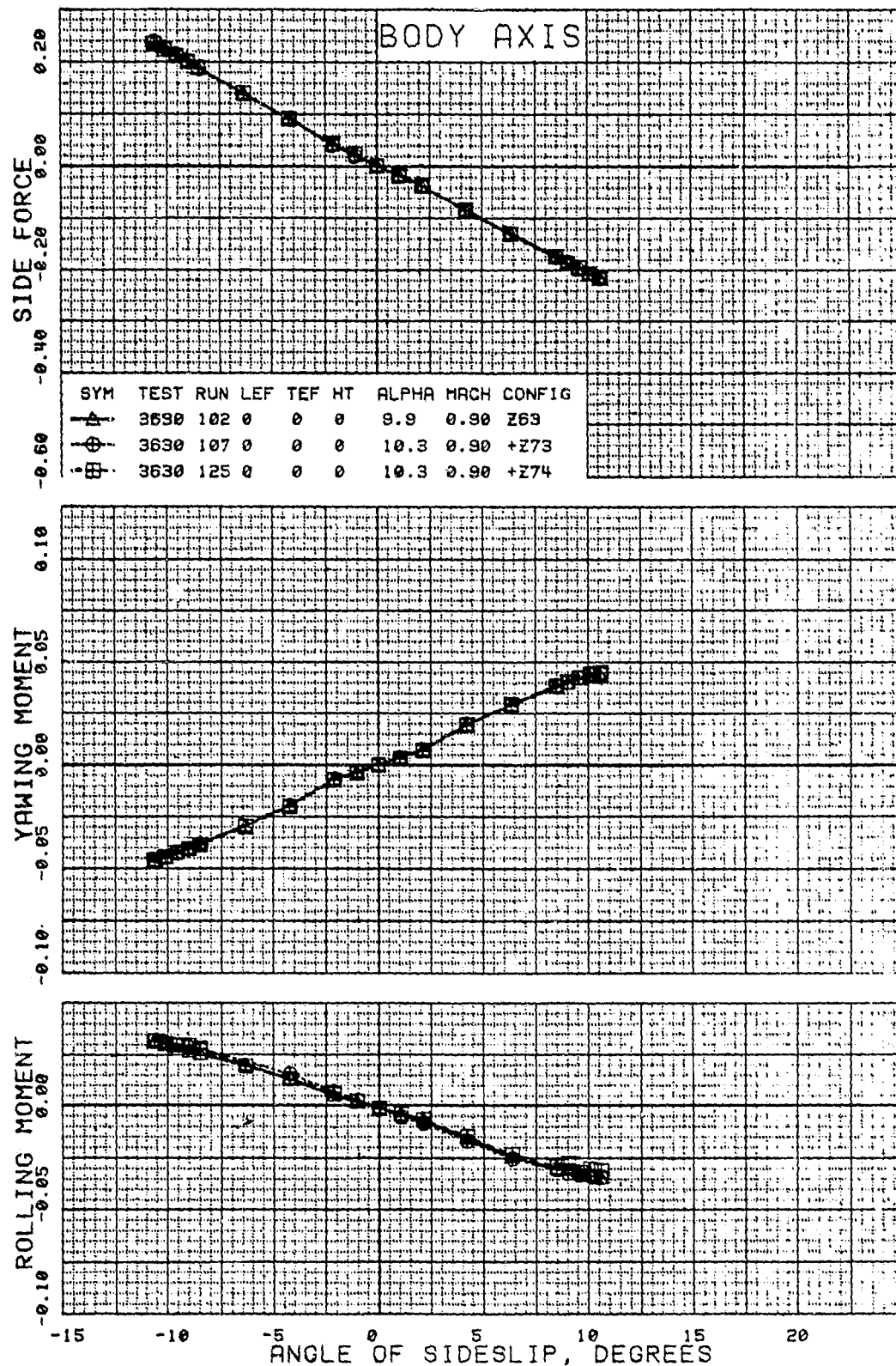


Figure 4-49 Effect of Nose Strakes Z73 and Z74, YF-16 + 30.5 Stretch, LEF = 0, M = 0.90

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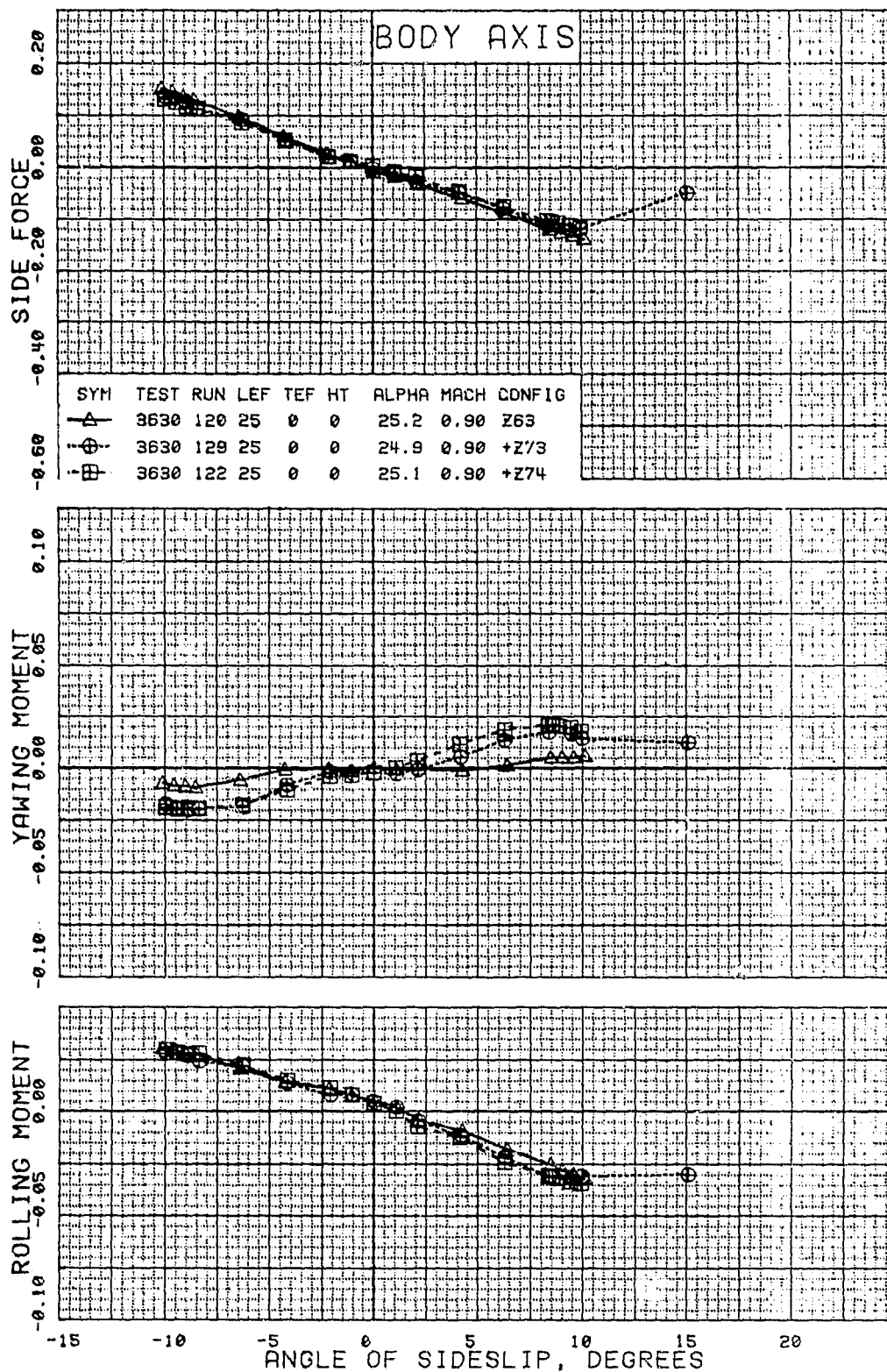


Figure 4-50 Effect of Nose Strakes Z73 and Z74, YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90

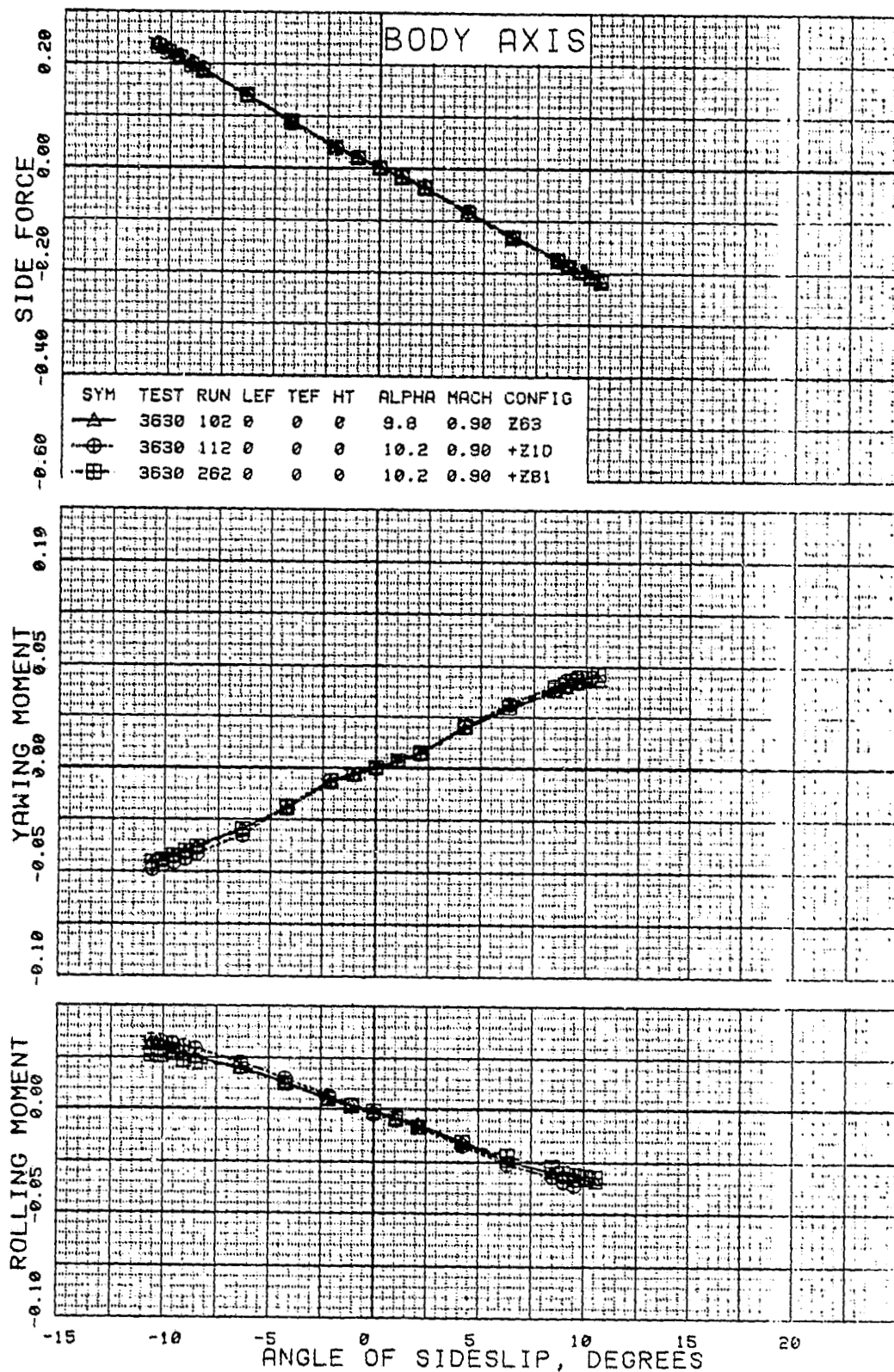


Figure 4-51 Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, LEF = 0, M = 0.90

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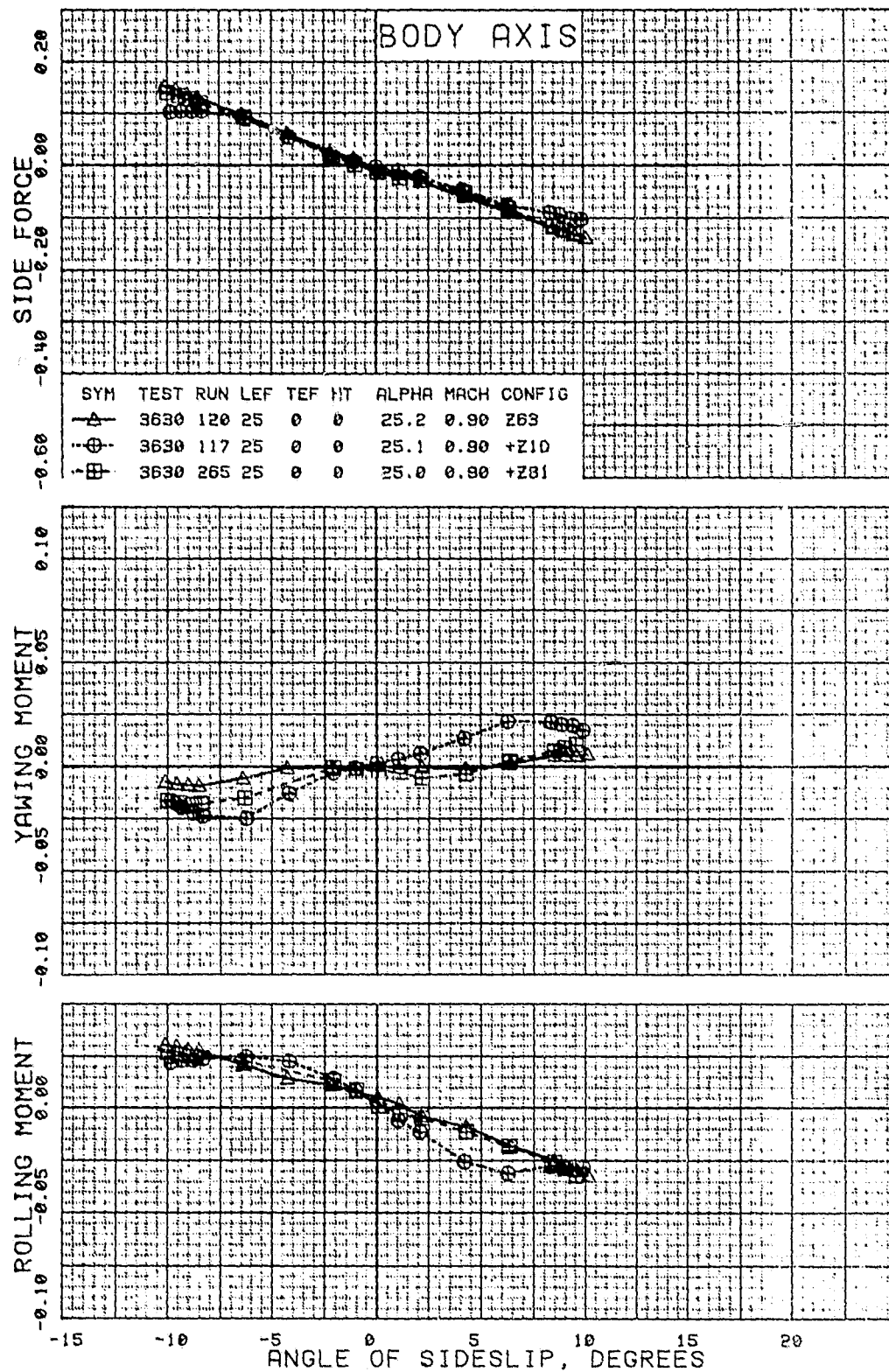


Figure 4-52 Effect of Canard Strakes Z1D and Z81, YF-16 + 30.5 Stretch, LEF = 25°, M = 0.90

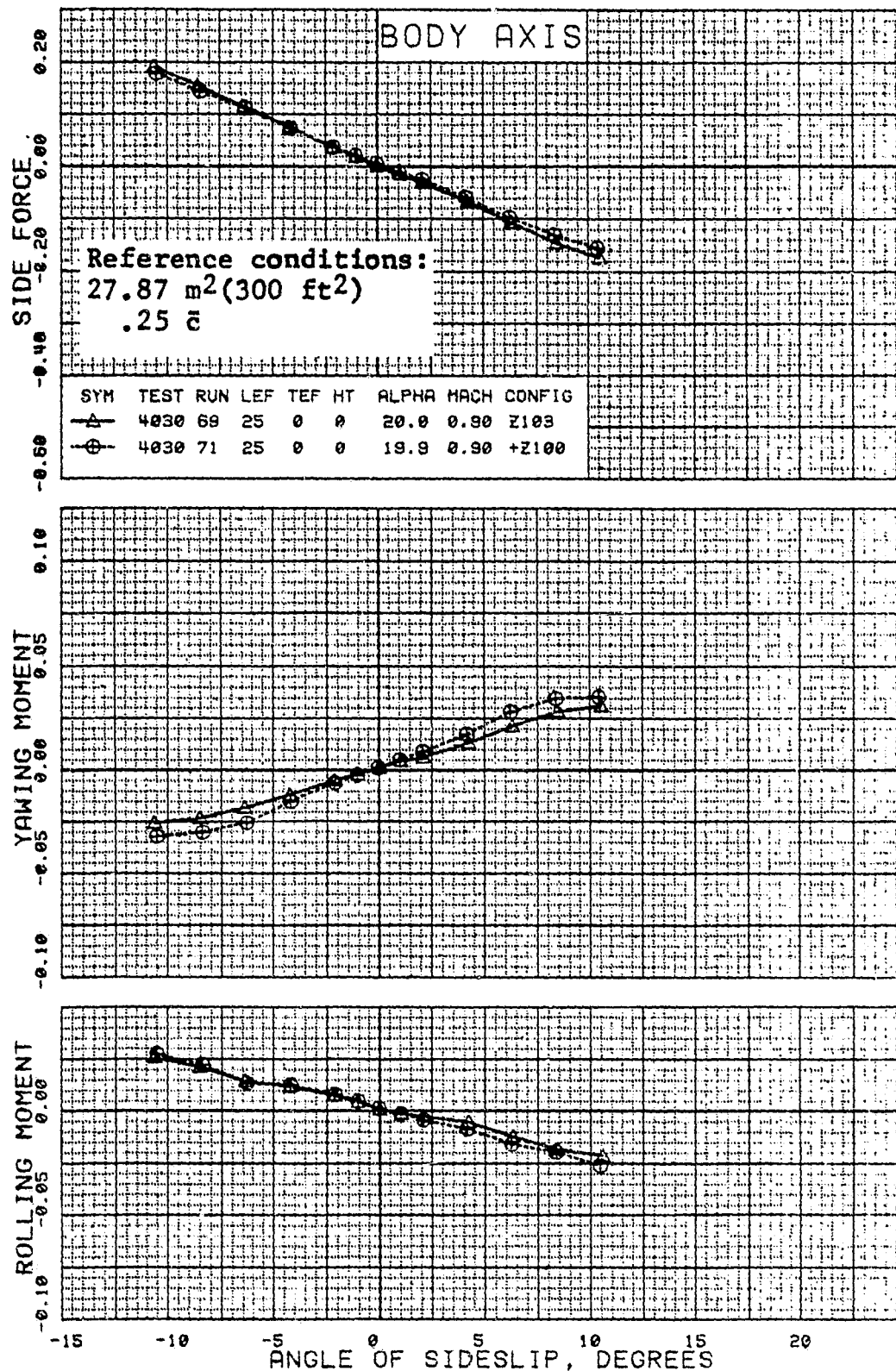


Figure 4-53 Effect of Nose Strake Z100, F-16, M = 0.90
(a) Force and Moments, $\alpha = 20^\circ$

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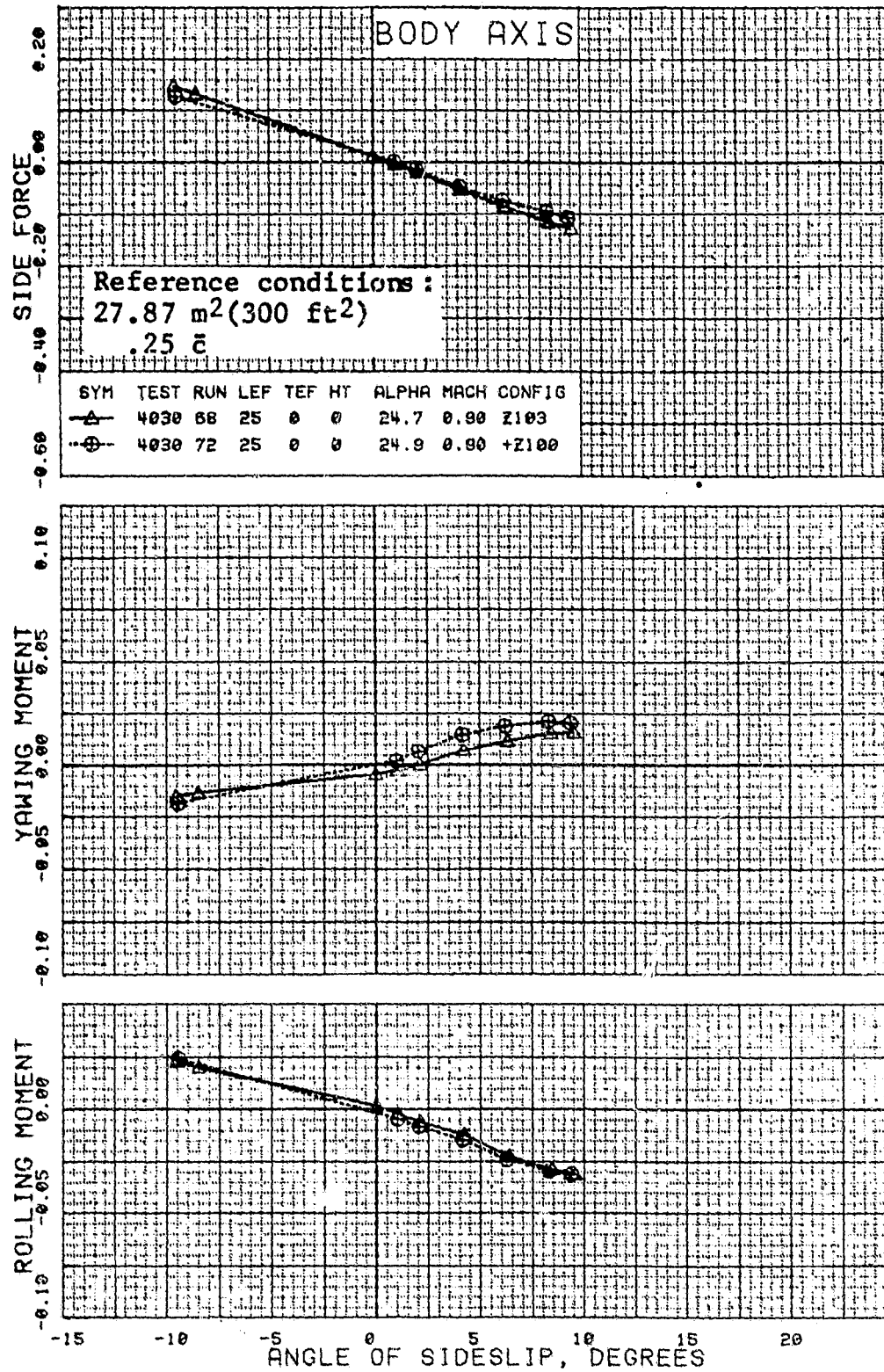


Figure 4-53 (b) Force and Moments, $\alpha = 25^\circ$

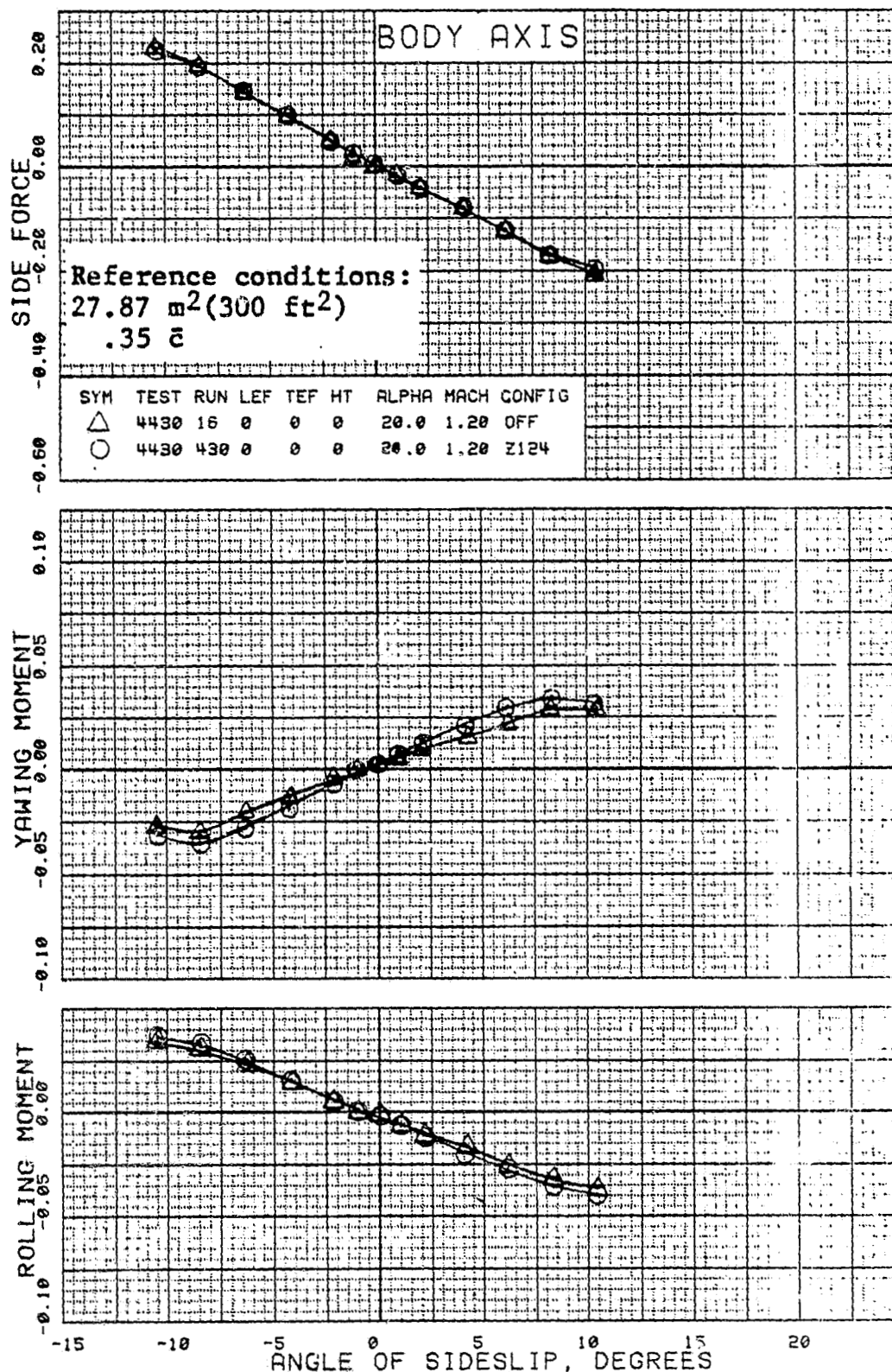


Figure 4-54 Effect of Nose Strake Z124, F-16, M = 1.20
 (a) Force and Moments, $\alpha = 20^\circ$

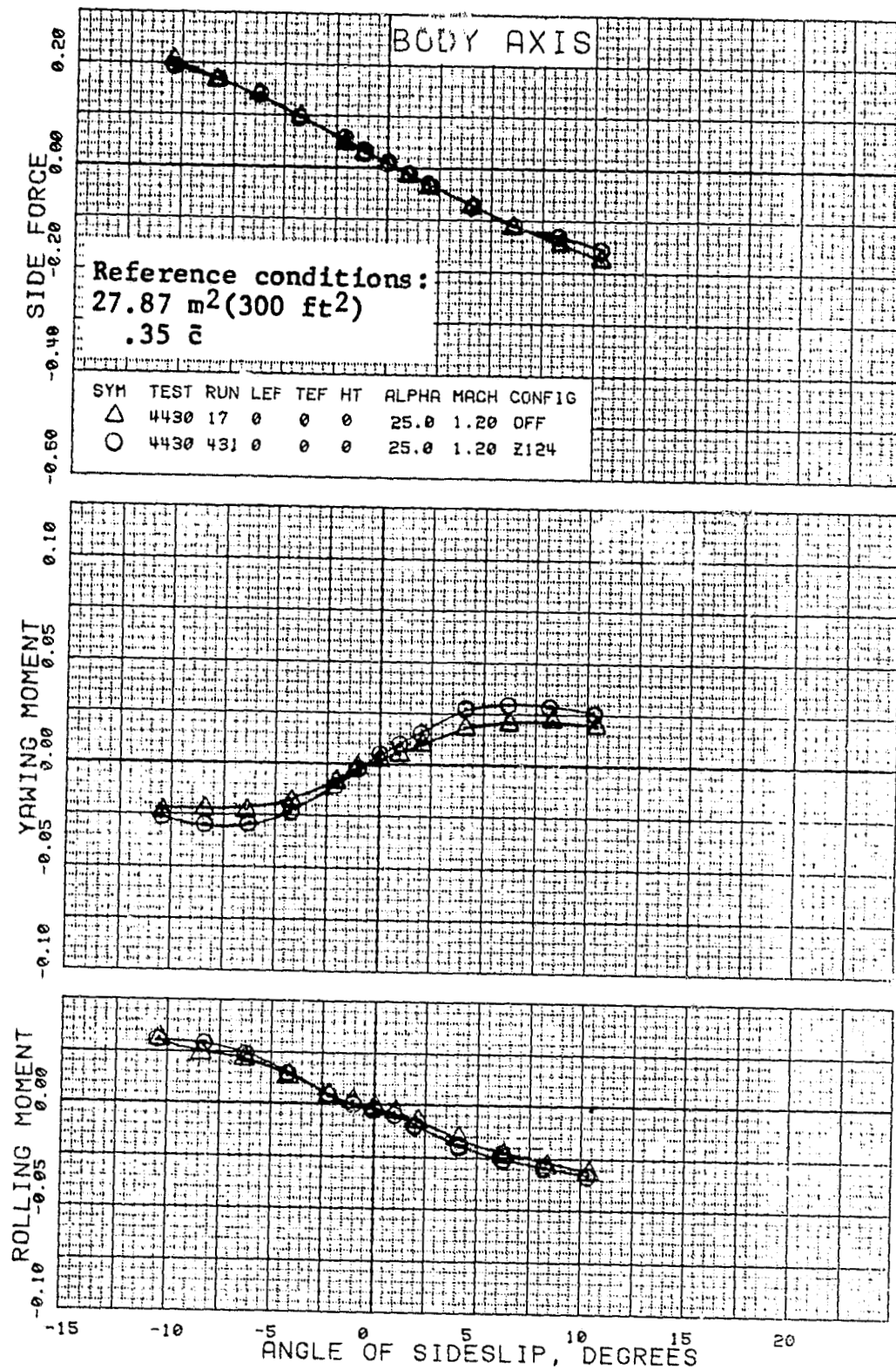


Figure 4-54 (b) Force and Moments, $\alpha = 25^\circ$

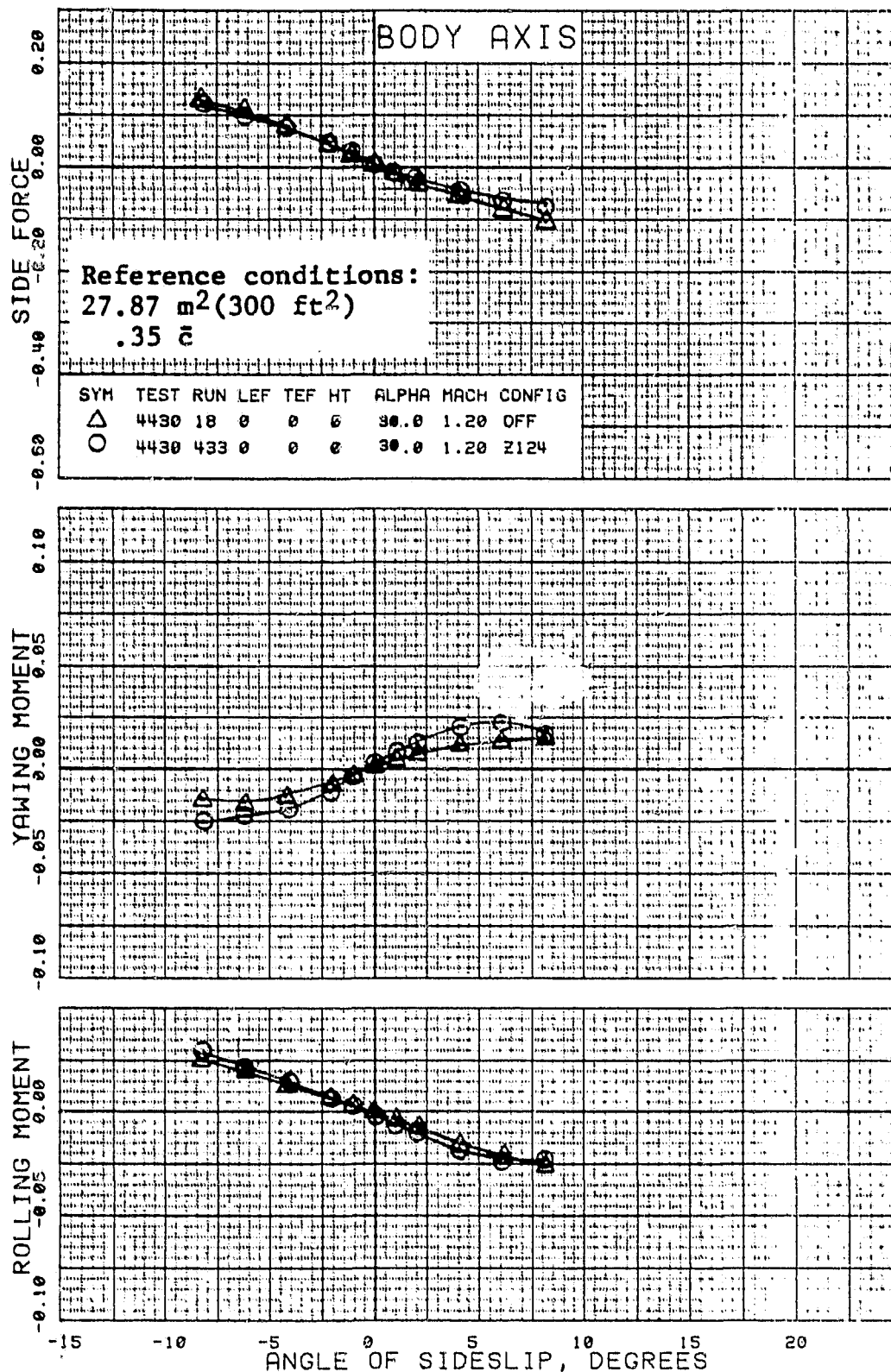


Figure 4-54 (c) Force and Moments, $\alpha = 30^\circ$

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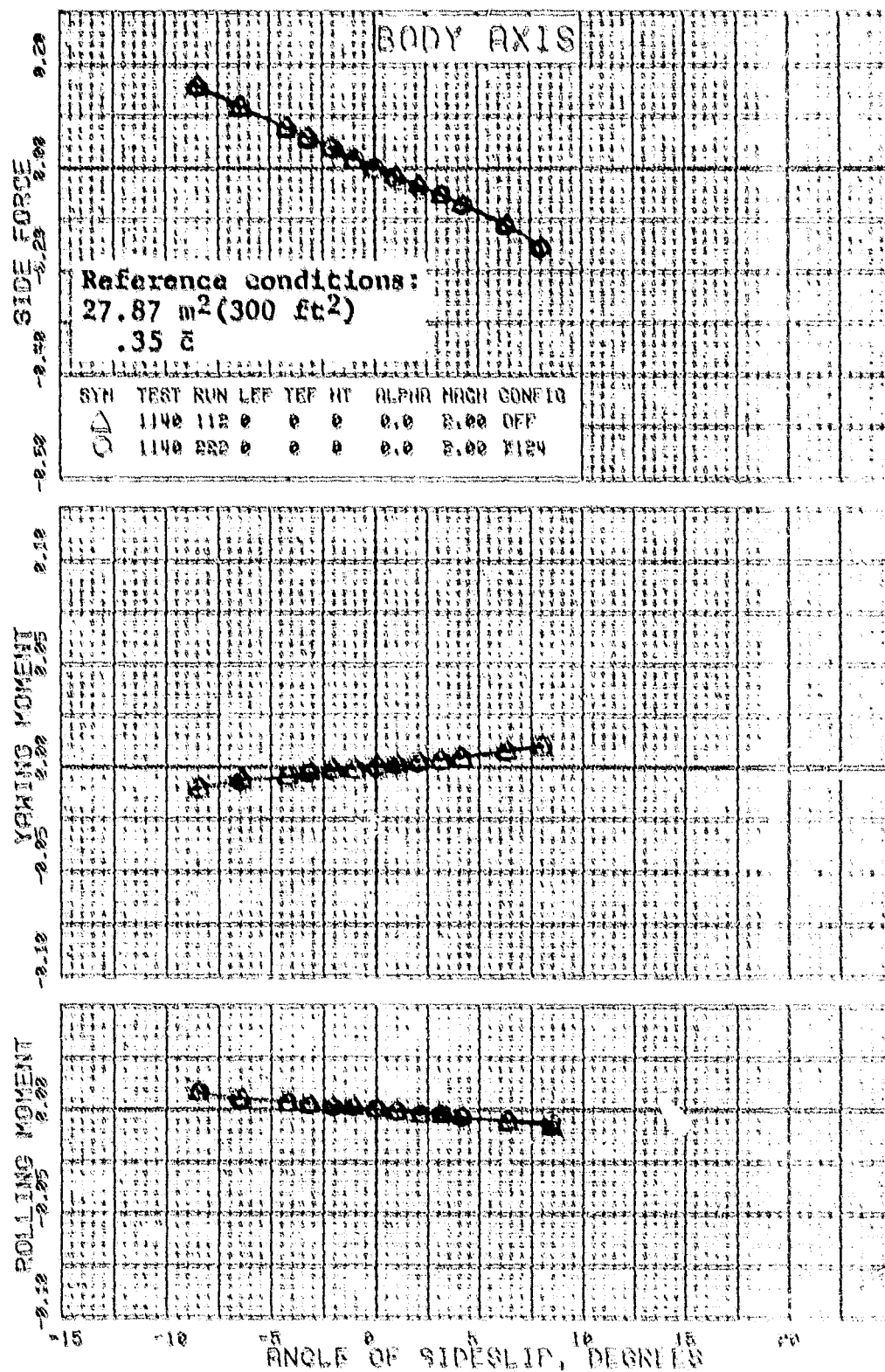


Figure 4-55 Effect of Nose Strake E124, F-16, $M = 2.00$
 (a) Force and Moments, $\alpha = 0^\circ$

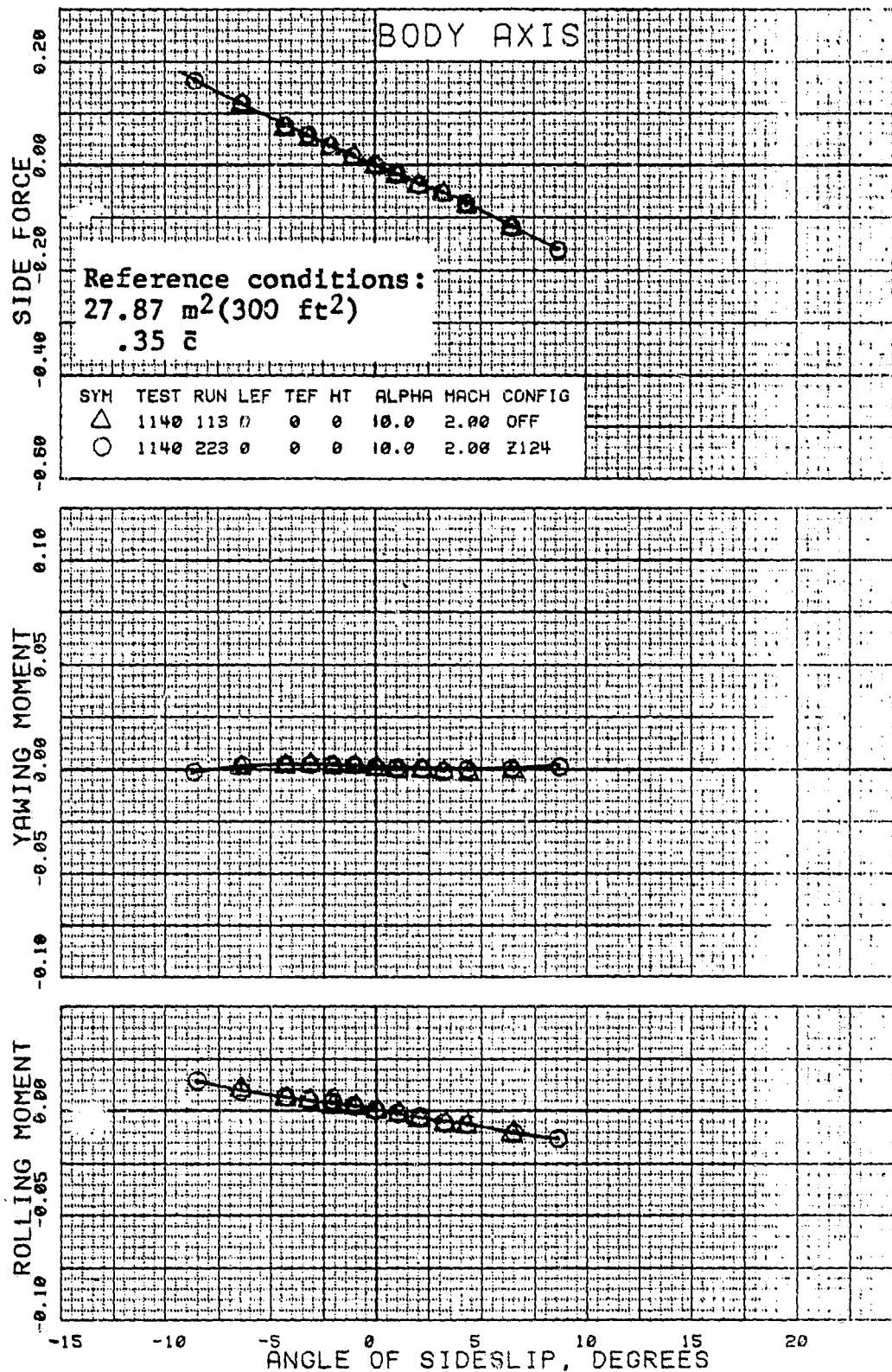


Figure 4-55 (b) Force and Moments, $\alpha = 10^\circ$

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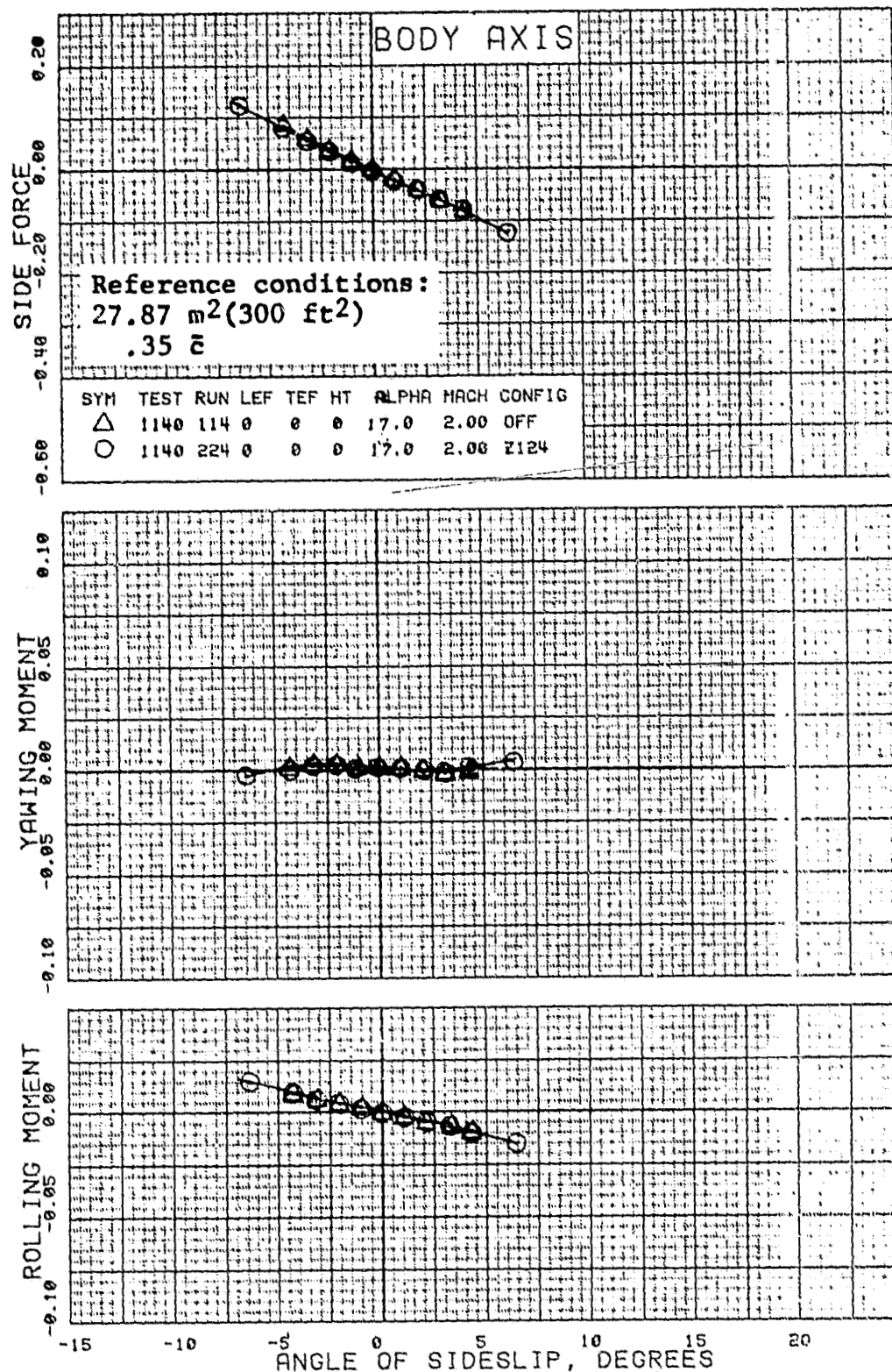


Figure 4-55 (c) Force and Moments, $\alpha = 17^\circ$

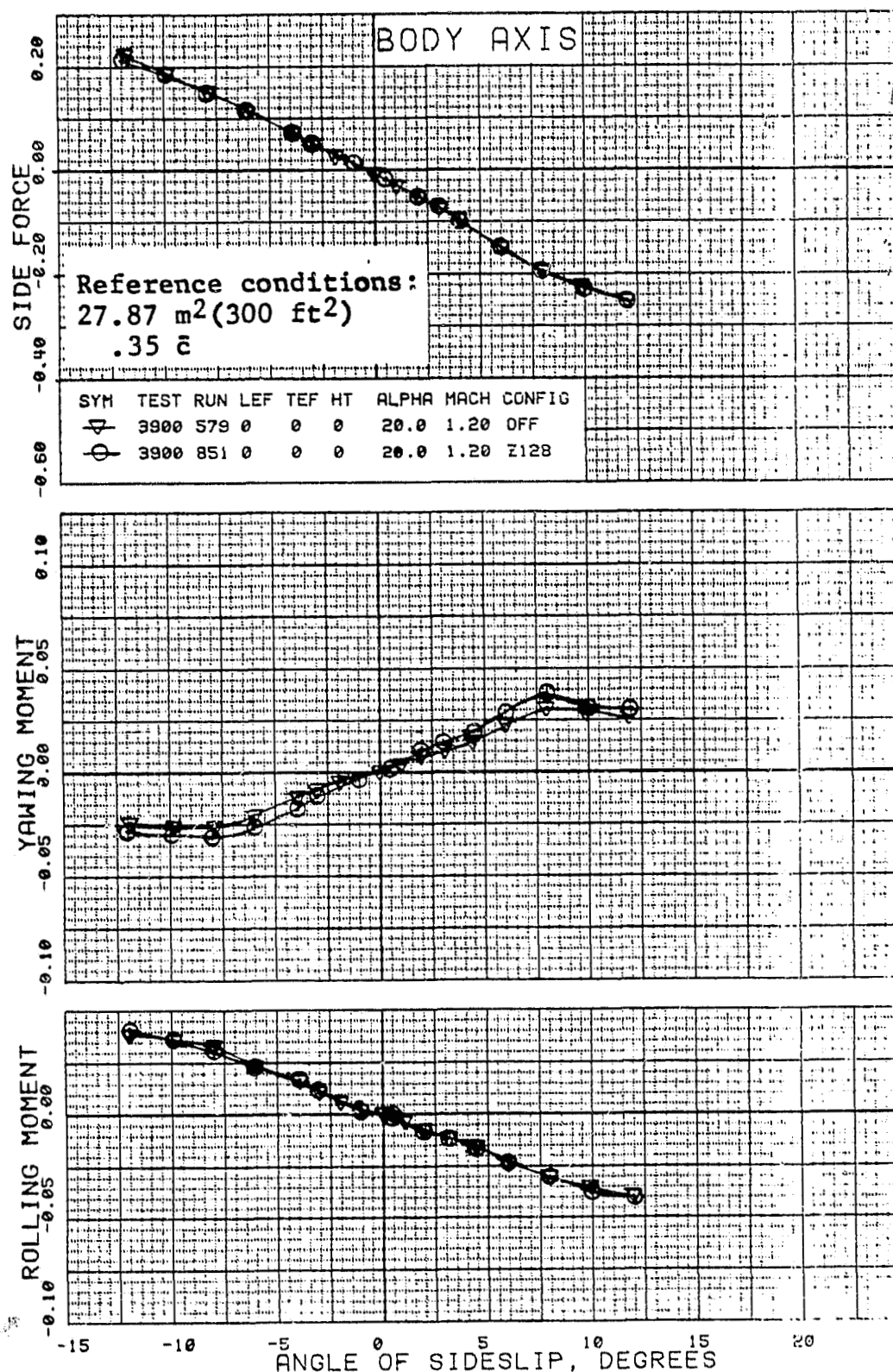


Figure 4-56 Effect of Nose Strake Z128, F-16, $M = 1.20$
 (a) Force and Moments, $\alpha = 20^\circ$

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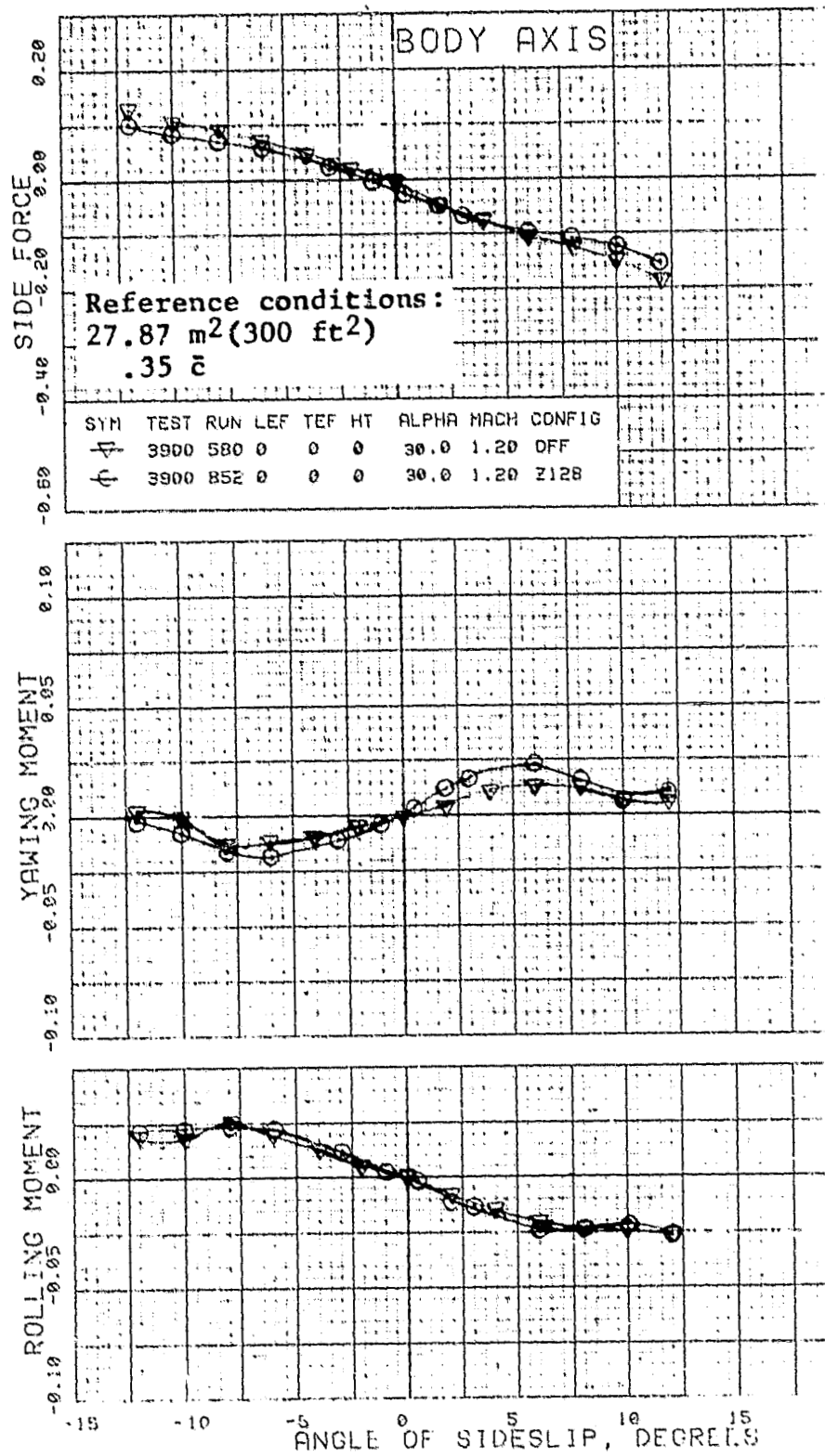


Figure 4-56 (b) Force and Moments, $\alpha = 30^\circ$